

# Standard Project Manual for Utility and Street Construction

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## Bidding Requirements, Contracting Requirements, and Specifications

January 1, 2020





## **2020 Woodbury Standard Project Manual for Utility and Street Construction Updates and Revisions as of January 1, 2020**

### **00 52 10 AGREEMENT FORM**

#### **6.02    *Progress Payments; Retainage***

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment, monthly during performance of the Work as provided in Paragraphs 6.02.A1 and 6.02.A2 below. All such payments will be measured by the Schedule of Values established in Paragraph 2.07.A of the General Conditions (and in the case of Bid Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided in the General Requirements:
- 2. No later than 60 days after the date of Substantial Completion, retainage shall be paid except as follows:
  - a. An amount up to 250% of the cost to correct or complete work known at the time of Substantial Completion shall be retained, and
  - b. The greater of \$500 or 1% of the value of the contract shall be retained until all contract final paperwork is finalized. Final paperwork is defined as documents required by the contract which may include but are not limited to:
    - 1) Operations manuals, as built drawings, and submittals required by the contract document, and
    - 2) Payroll documents for projects with prevailing wage requirements, and
    - 3) IC 134, and
    - 4) Lien Releases.

### **00 73 05 SUPPLEMENTARY CONDITIONS**

SC1.01.A.40    Delete paragraph 1.01.A.40 in its entirety and replace with the following:

40. *Substantial Completion* – Substantial Completion shall be as defined in the Agreement.

### **01 31 00 FLEXIBLE PAVING (MUNICIPAL PROJECTS)**

#### **1.05    SEQUENCING AND SCHEDULING**

- H. Bituminous wedge must start no sooner than one week after placement of initial wearing course lift and must be completed before private utility installation begins and within two weeks of placement of the initial wearing course lift.

### **32 10 00 WATER UTILITIES**

#### **2.04    BUTTERFLY VALVE AND BOX**

- A. General Requirement: AWWA C504.
- B. Mechanical joint valve ends conforming to AWWA C111/A21.11.
- C. AWWA C504 class 250.
- D. Wrap butterfly valve with pipe encasement.

- E. Valve Box:
  - 1. 3-piece, ductile iron, screw type.
  - 2. Valves and boxes to be considered integral units.
  - 3. 5-1/4 inch diameter shafts.
  - 4. Round or oval bases
  - 5. "stay-put" type drop covers, bearing the word "WATER" on top with extended skirts.
  - 6. Valve Adaptor: Adaptor Inc., or approved equal.

## **32 10 00 SANITARY UTILITY SEWER PIPING**

### **1.02 PRICE AND PAYMENT PROCEDURES**

- F. Measurement and Payment
  - 1. Sanitary Sewer Pipe: Measurement will be per lineal foot for each size and type for furnishing and installing pipe complete in place as specified, including excavation, backfilling, and compaction. Pipe will be measured from center to center of manholes, or to the connection point of the existing pipe.:
    - a. PVC pipe bedding will be paid in accordance with section 33 05 05.
    - b. Improved pipe foundation material, if necessary, shall be per section 33 05 05.
    - c. Furnishing and installing plugs and sewer marker ball on dead end lines will be considered incidental to the pipe.

## **33 39 00 SANITARY UTILITY SEWER STRUCTURES**

### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 2. Sanitary Sewer Manhole: Measurement will be per linear foot of depth from final rim elevation to lowest invert elevation based on the diameter of the manhole. Payment will include the manhole, manhole frame and casting, and adjusting rings in place as specified on the Drawings:
    - a. Separate payment shall be made in accordance with Section 33 05 17 for placement of frame, casting, and adjustment rings.
    - b. 70-percent partial payment will be made upon installation of the structure and 30-percent payment will be made upon final completion of doghouses and inverts.

## **33 39 00 STORM DRAINAGE UTILITIES**

### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Storm Sewer Pipe: Measurement will be per linear foot for each size, type, and class of pipe furnished and installed complete in place as specified, including excavation, backfilling, and compaction. Pipe will be measured from center of structure to center of structure, to the connection point of existing pipe or to the connection point to flared end sections:
    - a. Pipe bedding will be paid in accordance with Section 33 05 05.
    - b. Improved pipe foundation material, if necessary, shall be per Section 33 05 05.
  - 2. Catch Basin, Catch Basin Manhole, and Manhole Structure: Measurement will be per linear foot of depth from final rim elevation to lowest invert elevation according to type and size for furnishing and installing structures complete in place as specified, including casting frame and cover, adjusting rings, grouting invert (if required) and concrete stool grate frame per Detail STO-38 (if required).

- a. 70-percent partial payment will be made upon installation and 30-percent payment will be made upon final completion of doghouses and inverts.
- 13. Construct Manhole Over Existing Pipe: Measurement will per linear foot of depth from final rim elevation to lowest invert elevation according to size. Payment will include the cost of the manhole and installation over the existing line, casting frame and cover, and adjusting rings in place as specified.

**END OF SECTION**

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**SECTION 00 01 05**  
**PROFESSIONAL CERTIFICATIONS**

This City of Woodbury Standard Project Manual is hereby approved for application on street and utility related construction contracts. Changes can be made to this manual only by the City of Woodbury.

I hereby certify that this Standard Project Manual was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



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Tony Kutzke, P.E.

Date: January 1, 2020 License # 46709

**END OF SECTION**

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**END OF SECTION**

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### ADVERTISEMENT FOR BIDS

Sealed Bids will be received by the City of Woodbury, Minnesota, in the City Hall at 8301 Valley Creek Road, until **{{Bid Time}}**, **{{Bid Date}}**, at which time they will be publicly opened and read aloud for the furnishing of all labor, materials, and all else necessary for the following:

#### **{{Project Name}}**

In general, work consists of the following approximate quantities:

#### **{{General Description of work and major quantities}}**

Bidders desiring a copy of the Bidding Documents may obtain them from the Issuing Office of {{Name, address, phone number of Issuing Office}} upon payment of a non-refundable fee of {{Bid Package Price}}. Bidding Documents may be seen at the office of the City of Woodbury Public Works/Engineering Department and at the Issuing Office.

The City of Woodbury has adopted a standard document entitled "Standard Project Manual for Utility and Street Construction", dated January 1, 2020, which includes the Procurement and Contracting Requirements and Specifications which are hereby incorporated into the Bidding Documents. Bidders are required to obtain a copy of this standard document once per year. An electronic copy may be obtained for no charge from the City of Woodbury website at the following link:

<http://www.ci.woodbury.mn.us/engineering/standard-project-manual>

Direct inquiries to Engineer's Project Manager **{{Project Manager's Name}}** at **{{Project Manager's Phone Number}}**.

Bid Security in the amount of 5 percent of the amount of the Bid must accompany each Bid in accordance with the Instructions to Bidders.

The Owner reserves the right to retain the deposits of the 3 lowest Bidders for a period not to exceed 60 days after the date and time set for the Opening of Bids. No Bids may be withdrawn for a period of 60 days after the date and time set for the Opening of Bids.

The Owner reserves the right to reject any and all Bids, to waive irregularities and informalities therein, and further reserves the right to award the Contract to the best interests of the Owner.

Clinton P. Gridley, City Administrator  
City of Woodbury, Minnesota

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**SECTION 00 21 13**  
**INSTRUCTIONS TO BIDDERS**

**ARTICLE 1 - DEFINED TERMS**

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

- A. Issuing Office – The office from which the Bidding Documents are to be issued and where the Bidding procedures are to be administered.

**ARTICLE 2 - COPIES OF BIDDING DOCUMENTS**

- 2.01 Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the Advertisement or Invitation for Bids may be obtained from the Issuing Office.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.
- 2.04 Neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from Bidder's use of electronic downloadable Bidding Documents (Electronic Bidding Documents). In addition to the above items, Bidders using Electronic Bidding Documents are solely responsible for use of such documents, including, but not limited to:
  - A. It is the responsibility of the Bidder to go to the appropriate website, check for the presence of Bidding Documents (including Addenda), and download documents as they become available. Bidder shall regularly check the appropriate website for Addenda or other additions or revisions to the Bidding Documents through the Bid Opening date, whether or not Bidder has received email notice of Addenda from Engineer.
  - B. It is the responsibility of the Bidder to verify the intended document size (sheet dimensions) and to verify proper colors (color, or black and white) of the Electronic Bidding Documents prior to reproduction. Bidder shall ensure that the Electronic Bidding Documents are reproduced to the correct and exact scale, and correct colors.
  - C. It is the responsibility of the Recipient of Electronic Bidding Documents from this site to check the electronic data for computer viruses or other harmful coding.
  - D. Bidders are subject to the Terms of Use and Limitations on Use detailed in the Electronic Bidding Documents website.

## **ARTICLE 3 - QUALIFICATIONS OF BIDDERS**

- 3.01 To demonstrate Bidder's qualifications to perform the Work, within 5 days of Owner's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below:
- A. Evidence of Bidder's authority to do business in the state where the Project is located.
  - B. Evidence of genuineness of Bid and lack of collusion in conjunction therewith.
- 3.02 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

## **ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE**

### **4.01 Subsurface and Physical Conditions**

- A. The Supplementary Conditions identify:
  - 1. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site.
  - 2. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. Copies of reports and drawings referenced in Paragraph 4.01.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.02 of the General Conditions has been identified and established in Paragraph 4.02 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

### **4.02 Underground Facilities**

- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner or others.

### **4.03 Hazardous Environmental Condition**

- A. The Supplementary Conditions identify any reports and drawings known to Owner relating to a Hazardous Environmental Condition identified at the Site.
- B. Copies of reports and drawings referenced in Paragraph 4.03.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.06 of the General Conditions has been identified and established in Paragraph 4.06 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

- 4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions

appear in Paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 4.06 of the General Conditions.

- 4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.
- 4.06 Reference is made to Section 01 10 00 Summary of the Project Specific Manual for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of contract documents (other than portions thereof related to price) for such other work.
- 4.07 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;
  - B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
  - C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;
  - D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Paragraph 4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Paragraph 4.06 of the Supplementary Conditions as containing reliable "technical data;"
  - E. consider the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs;
  - F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) Bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
  - G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and
  - I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 4.08 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

## **ARTICLE 5 - PRE-BID CONFERENCE**

- 5.01 There will be no Pre-Bid Conference.

## **ARTICLE 6 - SITE AND OTHER AREAS**

- 6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner, unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

## **ARTICLE 7 - INTERPRETATIONS AND ADDENDUM**

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addendum mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than 10 days prior to the date for Opening of Bids may not be answered. Only questions answered by Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

## **ARTICLE 8 - BID SECURITY**

- 8.01 A Bid must be accompanied by Bid Security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid Bond issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.
- 8.02 The Bid Security of the successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required Contract Security and met the other conditions of the Notice of Award, whereupon the Bid Security will be returned. If the successful Bidder fails to execute and deliver the Contract Documents and furnish the required Contract Security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid Security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults. The



Bid Security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Agreement or 61 days after the Bid Opening, whereupon Bid Security furnished by such Bidders will be returned.

- 8.03 Bid Security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within 7 days after the Bid Opening.

## **ARTICLE 9 - CONTRACT TIMES**

- 9.01 The number of days within which, or the dates by which, Milestones are to be achieved and the Work is to be Substantially Completed and ready for Final Payment are set forth in the Agreement.

## **ARTICLE 10 - LIQUIDATED DAMAGES**

- 10.01 Provisions for liquidated damages, if any, are set forth in the Agreement.

## **ARTICLE 11 - SUBSTITUTE AND "OR-EQUAL" ITEMS**

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

## **ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS**

- 12.01 If the Supplementary Conditions require the identity of certain subcontractors, suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent successful Bidder, and any other Bidder so requested, shall within 5 days after Bid Opening, submit to Owner a list of all such subcontractors, suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such subcontractor, supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed subcontractor, supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent successful Bidder to submit a substitute, in which case apparent successful Bidder shall submit an acceptable substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 12.02 If apparent successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable subcontractors, suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid Security of any Bidder. Any subcontractor, supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.
- 12.03 Contractor shall not be required to employ any subcontractor, supplier, individual, or entity against whom Contractor has reasonable objection.

## **ARTICLE 13 - PREPARATION OF BID**

- 13.01 The Bid Form is included with the Bidding Documents.
- 13.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid Item, Alternate, adjustment Bid Unit Price Bid Item, and Bid Unit Price Bid Item listed therein.
- 13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.06 A Bid by an individual shall show the Bidder's name and official address.
- 13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.08 All names shall be printed in ink below the signatures.
- 13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.10 Postal and e-mail addresses and telephone and fax numbers for communications regarding the Bid shall be shown.
- 13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

## **ARTICLE 14 - BASIS OF BID; COMPARISON OF BIDS**

- 14.01 Unit Price, or Unit Price With Alternates
- A. Bidders shall submit a Bid on a Bid Unit Price basis for each Bid Item of Work listed in the Bid Form.
1. If an Alternate is present, include a separate unit price for each Alternate provided on the Bid Form. The price for the Alternates will be the amount added to or deleted from the Base Bid if the Owner selects the Alternate. In the evaluation of Bids, Owner may select any combination of Alternates or Owner may choose not to accept any Alternate Bids.

- B. The total of all estimated prices will be the sum of the products of the estimated quantity of each Bid Item and the corresponding Bid Unit Price. The final quantities and Contract Price will be determined in accordance with Paragraph 11.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of work and Bid Unit Prices will be resolved in favor of the Bid Unit Prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.
- D. Bids will be evaluated and the low Bidder determined pursuant to Article 19.
  - 1. If no Alternate is present, bids will be compared on the basis of the "Total Base Bid" and this amount will be the basis for determining the lowest Bidder.
  - 2. If an Alternate is present, bids will be compared on the basis of the "Adjusted Total Base Bid" and this amount will be the basis for determining the lowest Bidder. The sum of the Total Base Bid and any combination of Alternates accepted by the Owner will determine the "Adjusted Total Base Bid."

#### 14.02 Allowances

- A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 11.02.B of the General Conditions.

### **ARTICLE 15 - SUBMITTAL OF BID**

- 15.01 Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement or Invitation for Bids and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid Security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to Owner's office.
- 15.02 The Bid shall include the entire Document 004110, Bid Form. This includes all attachments listed in Article 7.01 of the bid form and/or all forms included with the Bid Form. The Contractor may remove or copy these sheets from the Project Manual.
- 15.03 The entire Project Manual should not be submitted with the Bid.

### **ARTICLE 16 - MODIFICATION AND WITHDRAWAL OF BID**

- 16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the Opening of Bids.
- 16.02 Bids may be withdrawn after Bid Opening only in accordance with the law.

### **ARTICLE 17 - OPENING OF BIDS**

- 17.01 Bids will be opened at the time and place indicated in the Advertisement or Invitation for Bids and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the Base Bids and major Alternates, if any, will be made available to Bidders after the Project is awarded.

## **ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid Security prior to the end of this period.

## **ARTICLE 19 - EVALUATION OF BIDS AND AWARD OF CONTRACT**

19.01 If the Contract is awarded, award will be made on the basis of the lowest responsive, responsible, qualified Bidder determined by the Total Base Bid, or Adjusted Total Base Bid if an Alternate is present, which is found by the City to be in the best interest of the project.

19.02 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the successful Bidder.

19.03 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

19.04 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such Alternates, Bid Unit Prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

19.05 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.

19.06 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents. As a condition of its Bid, Bidder is required to waive any and all claims of whatever nature against Owner, Engineer, and their employees and agents which arise out of or relate to such investigations and statements made as a result thereof, except for statements that can be shown by clear and convincing evidence to be intentionally false and made with actual malice. This waiver is not intended to restrict Bidder's rights to challenge a Contract pursuant to law.

## **ARTICLE 20 - CONTRACT SECURITY AND INSURANCE**

20.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

## **ARTICLE 21.01 - SIGNING OF AGREEMENT**

21.01 When Owner issues a Notice of Award to the successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents which are identified in the Agreement as attached thereto. Within 15 days thereafter, successful Bidder shall

sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within 10 days thereafter, Owner shall deliver 2 fully signed counterparts to successful Bidder with a complete set of the Drawings with appropriate identification.

**END OF SECTION**

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BIDDER: \_\_\_\_\_

DOCUMENT 00410

**BID FORM**

PROJECT NAME

CITY PROJECT NO.

PROJECT NO.

WOODBURY, MINNESOTA

**THIS BID IS SUBMITTED TO:**

City of Woodbury  
City Hall  
8301 Valley Creek Road  
Woodbury, MN 55125

1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for 60 days after the Bid Opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

3.01 In submitting this Bid, Bidder represents that:

- A. Bidder has examined and carefully studied the Bidding Documents, including the City of Woodbury's Standard Project Manual for Utility and Street Construction, dated January 1, 2020, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.

Addendum Date

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that have been identified in Division 00 of the Project Specific Manual, and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Division 00 of the Project Specific Manual.

- E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.
- F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the work for which this Bid is submitted.
- J. Bidder will submit written evidence of its authority to do business in the state where the Project is located not later than the date of its execution of the Agreement.

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

"corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

"fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

"collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and



"coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

- E. Bidder has completed and executed the attached "Responsible Contractor -Proposal Attachment" relating to Minn Statute 16C.285, "Responsible Contractor."

5.01 Bidder will complete the work in accordance with the Contract Documents for the following price(s):

Unit Prices have been computed in accordance with Paragraph 13.03 of the General Conditions.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and Final Payment for all Unit Price Bid Items will be based on actual quantities provided, determined as provided in the Contract Documents.

The Bid Form shall cover all Work depicted on the contract drawings and/or required by the Specifications. All costs in connection with the Work including furnishing of all materials, equipment, and performing necessary labor, coordination, supervision, and management to fully complete the Work, shall be included in the Unit or Lump Sum prices quoted in the Bid Form. All Work not specifically set forth as a pay item in the Bid Form shall be considered incidental to the Project and all costs in connection therewith shall be included in the amounts and prices submitted in the Bid Form.

No.	Item	Units	Qty	Unit Price	Total Price
<b>PART 1 - SANITARY SEWER:</b>					
1				\$ _____	\$ _____
2				\$ _____	\$ _____
<b>TOTAL PART 1 - SANITARY SEWER</b>					\$ _____
<b>PART 2 - WATER MAIN:</b>					
3				\$ _____	\$ _____
4				\$ _____	\$ _____
<b>TOTAL PART 2 - WATER MAIN</b>					\$ _____
<b>PART 3 - SERVICES:</b>					
5				\$ _____	\$ _____
6				\$ _____	\$ _____
<b>TOTAL PART 3 - SERVICES</b>					\$ _____

No.	Item	Units	Qty	Unit Price	Total Price
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**PART 4 - STORM SEWER:**

7 \$ \_\_\_\_\_ \$ \_\_\_\_\_

8 \$ \_\_\_\_\_ \$ \_\_\_\_\_

**TOTAL PART 4 - STORM SEWER** \$ \_\_\_\_\_

**PART 5 - STREET IMPROVEMENTS:**

9 \$ \_\_\_\_\_ \$ \_\_\_\_\_

10 \$ \_\_\_\_\_ \$ \_\_\_\_\_

**TOTAL PART 5 - STREET IMPROVEMENTS** \$ \_\_\_\_\_

**BASE BID:**

TOTAL PART 1 - SANITARY SEWER \$ \_\_\_\_\_

TOTAL PART 2 - WATER MAIN \$ \_\_\_\_\_

TOTAL PART 3 - SERVICES \$ \_\_\_\_\_

TOTAL PART 4 - STORM SEWER \$ \_\_\_\_\_

TOTAL PART 5 - STREET IMPROVEMENTS \$ \_\_\_\_\_

**TOTAL BASE BID** \$ \_\_\_\_\_

6.01 Bidder agrees that the work will be Substantially Completed and completed and ready for Final Payment in accordance with Paragraph 15.06.B of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

7.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security in the form of Five Percent.
- B. Required Section 00 41 15 - Responsible Contractor - Proposal Attachment - Initial Contactor Verification of Compliance.

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

SUBMITTED on \_\_\_\_\_, 20\_\_

9.01 This Bid submitted by:

If Bidder Is:

An Individual

Name (typed or printed): \_\_\_\_\_

By: \_\_\_\_\_ (SEAL)  
(Individual's signature)

Doing business as: \_\_\_\_\_

Business address: \_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

A Partnership

Partnership Name: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature of general partner)

Name (typed or printed): \_\_\_\_\_

Business address: \_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

A Corporation

Corporation Name: \_\_\_\_\_ (SEAL)

State of Incorporation: \_\_\_\_\_

Type (General Business, Professional, Service, Limited Liability): \_\_\_\_\_

By: \_\_\_\_\_  
(Signature)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

Attest \_\_\_\_\_ (CORPORATE SEAL)  
(Signature of Corporate Secretary)

Business address: \_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

A Joint Venture

Joint Venture Name: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature of joint venture partner)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

Business address: \_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Joint Venturer Name: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

Business address: \_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Phone and Fax Number, and Address for receipt of official communications:

\_\_\_\_\_

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above).

END OF DOCUMENT

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**SECTION 00 41 15 – RESPONSIBLE CONTRACTOR – PROPOSAL ATTACHMENT**

Page 1 of 2

**INITIAL CONTRACTOR VERIFICATION OF COMPLIANCE**

By signing this document I certify that I am an owner or officer of the company, and I swear under oath that:

My company meets each of the minimum criteria in subclauses (1) – (6) of Minn. Stat. § 16C.285, subd. 3, the Responsible Contractor statute.

The undersigned understands that a failure to meet or verify compliance with the minimum criteria established for a “responsible contractor” as defined in Minn. Stat. § 16C.285, subd. 3, renders a bidder ineligible to be awarded a construction contract for the Project or to perform work on the Project.

The undersigned understands that a false statement under oath verifying compliance with any of the minimum criteria shall make the undersigned, ineligible to be awarded a construction project and may result in termination of a contract awarded to the undersigned. A contracting authority shall not be liable for declining to award a contract or terminating a contract based on a reasonable determination that the contractor failed to verify compliance with the minimum criteria or falsely stated that it meets the minimum criteria.

The undersigned understands that, if the undersigned is the apparent low bidder, the undersigned will be required to submit a supplemental verification under oath as a condition precedent to the execution of the contract. If the undersigned fails to provide the required supplemental verification, it could forfeit its bid bond.

I have attached a list of all of my company’s first-tier subcontractors that it intends to retain for work on the project.

Initial Contractor Verification of Compliance – {Name of Project}	
Authorized Signature of Owner or Officer:	Printed Name:
Title:	Date:
Company Name:	

SECTION 00 41 15 – RESPONSIBLE CONTRACTOR – PROPOSAL ATTACHMENT

Page 2 of 2

SUBCONTRACTORS LIST

SUBCONTRACTOR NAMES (Legal name of company as registered with the Secretary of State)	Name of City Where Company Home Office is Located

Attach additional sheets if necessary.

Subcontractors List – {Name of Project}	
Authorized Signature of Owner or Officer:	Printed Name:
Title:	Date:
Company Name:	



**SECTION 00 51 15 – RESPONSIBLE CONTRACTOR – NOTICE OF AWARD**

**SUPPLEMENTAL CONTRACTOR VERIFICATION OF COMPLIANCE**

PROJECT TITLE: **{Name of Project}**

By signing this document I certify that I am an owner or officer of the company, and I swear under oath that:

My company meets each of the minimum criteria of Minn. Stat. § 16C.285, subd. 3, the Responsible Contractor statute.

Pursuant to Stat. § 16C.285, subd. 3(7), my company has obtained from all subcontractors and motor carriers with which it will have a direct contractual relationship a signed statement under oath by an owner or officer verifying that they meet all of the minimum criteria in subdivision 3 prior to execution of a construction contract with each subcontractor or motor carrier.

The undersigned agrees that, if it retains additional subcontractors on the project after submitting its verification of compliance, it shall obtain verifications of compliance from each additional subcontractor with which it has a direct contractual relationship and shall submit a supplemental verification confirming compliance with Minn. Stat. § 16C.285, subd. 3(7), within 14 days of retaining the additional subcontractors.

Upon request, the undersigned shall submit to the contracting authority copies of the signed verifications of compliance from all subcontractors of any tier and all motor carriers providing for-hire transportation of materials, equipment, or supplies for a project.

The undersigned understands that a failure to meet or verify compliance with the minimum criteria established for a “responsible contractor” as defined in Minn. Stat. § 16C.285, subd. 3, renders a bidder ineligible to be awarded a construction contract for the Project or to perform work on the Project.

The undersigned understands that a false statement under oath verifying compliance with any of the minimum criteria shall make the undersigned, ineligible to be awarded a construction project and may result in termination of a contract awarded to the undersigned. A contracting authority shall not be liable for declining to award a contract or terminating a contract based on a reasonable determination that the contractor failed to verify compliance with the minimum criteria or falsely stated that it meets the minimum criteria.

Supplemental Contractor Verification of Compliance – <b>{Name of Project}</b>	
Authorized Signature of Owner or Officer:	Printed Name:
Title:	Date:
Company Name:	

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**SECTION 00 51 16 – RESPONSIBLE CONTRACTOR – SUPPLEMENTAL**

**ADDITIONAL SUBCONTRACTORS LIST**

PRIME CONTRACTOR TO SUBMIT AS SUBCONTRACTORS ARE ADDED TO THE PROJECT

PROJECT TITLE:       **{Name of Project}**

This form must be submitted to the Project Manager or individual as identified in the solicitation document.

Minn. Stat. § 16C.285, Subd. 5. ... If a prime contractor or any subcontractor retains additional subcontractors on the project after submitting its verification of compliance, the prime contractor or subcontractor shall obtain verifications of compliance from each additional subcontractor with which it has a direct contractual relationship and shall submit a supplemental verification confirming compliance with subdivision 3, clause (7), within 14 days of retaining the additional subcontractors.

<b>ADDITIONAL SUBCONTRACTOR NAMES (Legal name of company as registered with the Secretary of State)</b>	<b>Name of city where company home office is located</b>

Additional Subcontractors List – <b>{Name of Project}</b>
<b>By signing this document I certify that I am an owner or officer of the company, and I swear under oath that:</b>
All additional subcontractors listed on Attachment A-2 have verified through a signed statement under oath by an owner or officer that they meet the minimum criteria to be a responsible contractor as defined in Minn. Stat. § 16C.285.

Authorized Signature of Owner or Officer:	Printed Name:
Title:	Date:
Company Name:	

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## SECTION 00 52 10

### AGREEMENT FORM

THIS AGREEMENT is by and between the City of Woodbury, Minnesota (hereinafter called Owner) and **{Name of Contractor}** (hereinafter called Contractor).

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

#### ARTICLE 1 – WORK

- 1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: municipal utility and street construction.

#### ARTICLE 2 – THE PROJECT

- 2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows: **{Name of Project}** for the City of Woodbury, Minnesota, City Project No. **{City Project No.}**.

#### ARTICLE 3 – ENGINEER

- 3.01 The Project has been designed by **{Name of Engineer}** (Engineer), who is to act as Owner's representative, assume all duties and responsibilities, and will have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

#### ARTICLE 4 – CONTRACT TIMES

##### 4.01 *Time of the Essence*

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for Final Payment as stated in the Contract Documents are of the essence of the Contract.

##### 4.02 *Dates for Substantial Completion and Final Payment*

- A. The Work will be Substantially Completed on or before **{Date}**, and completed and ready for Final Payment in accordance with Paragraph 14.07 of the General Conditions on or before **{Date}**. Substantial Completion Date shall be defined as the completion of the following items:
1. **{Item}**
  2. **{Item}**
  3. **{Item}**
- B. Except to the extent an earlier date is provided above for a portion of the Work, the Final Completion for the Project shall be **{Date}**.

##### 4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in

proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **{Dollar Amount}** for each day that expires after the time specified in Paragraph 4.02 for Milestones and Substantial Completion until the Work is Substantially Complete..

- B. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner **{Dollar Amount}** for each day that expires after the time specified in Paragraph 4.02 for completion and readiness for Final Payment until the Work is completed and ready for Final Payment.

## **ARTICLE 5 – CONTRACT PRICE**

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds as follows:
  - A. For all Work at the prices stated in Contractor's Bid, attached hereto as an exhibit. The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the General Conditions.
  - B. Original Contract Amount is based on **{fill in amount after Award}**.

## **ARTICLE 6 – PAYMENT PROCEDURES**

### **6.01 Submittal and Processing of Payments**

- A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

### **6.02 Progress Payments; Retainage**

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment, monthly during performance of the Work as provided in Paragraphs 6.02.A1 and 6.02.A2 below. All such payments will be measured by the Schedule of Values established in Paragraph 2.07.A of the General Conditions (and in the case of Bid Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided in the General Requirements:
  - 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below, but in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions:
    - a. 95 percent of Work completed (with the balance being retainage).
    - b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
  - 2. No later than 60 days after the date of Substantial Completion, retainage shall be paid except as follows:
    - a. An amount up to 250% of the cost to correct or complete work known at the time of Substantial Completion shall be retained, and

- b. The greater of \$500 or 1% of the value of the contract shall be retained until all contract final paperwork is finalized. Final paperwork is defined as documents required by the contract which may include but are not limited to:
  - 1) Operations manuals, as built drawings, and submittals required by the contract document, and
  - 2) Payroll documents for projects with prevailing wage requirements, and
  - 3) IC 134, and
  - 4) Lien Releases.

#### 6.03 *Final Payment*

- A. Upon Final Completion and acceptance of the Work, in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

### **ARTICLE 7 – INTEREST**

- 7.01 All moneys not paid when due, as provided in Article 14 of the General Conditions, shall bear interest at the maximum rate allowed by law at the place of the Project.

### **ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS**

- 8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:
  - A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
  - B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
  - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Supplementary Conditions as containing reliable "technical data."
  - E. Contractor considered the information known to Contractor, information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work, (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precaution programs.
  - F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are

necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

## **ARTICLE 9 – CONTRACT DOCUMENTS**

### **9.01 Contents**

- A. The Contract Documents consist of the following:
  - 1. This Agreement.
  - 2. Performance Bond, Payment Bond, and other Bonds.
  - 3. City of Woodbury, Minnesota Standard Project Manual for Utility and Street Construction, dated January 1, 2020, and all subsequent amendments.
  - 4. Project Specific Manual.
  - 5. Drawings bearing the following general title: **{Title of Drawings}**.
  - 6. Addenda (**{Addendum Letter}** to \_\_\_\_\_, inclusive).
  - 7. Exhibits to this Agreement (enumerated as follows):
    - a. Contractor's Bid Form.
    - b. Documentation submitted by Contractor prior to Notice of Award.
  - 8. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
    - a. Notice to Proceed.
    - b. Work Change Directives.
    - c. Change Order(s).
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

## **ARTICLE 10 – MISCELLANEOUS**

### **10.01 Terms**

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

### **10.02 Assignment of Contract**

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically



but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

#### 10.03 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

#### 10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

#### 10.05 Contractor's Certifications

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
  - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
  - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on \_\_\_\_\_, \_\_\_\_\_ (which is the Effective Date of the Agreement).

**Owner:**

City of Woodbury, Minnesota

By: \_\_\_\_\_  
Mayor, Anne W. Burt

By: \_\_\_\_\_  
City Administrator, Clinton P. Gridley

Address for giving notices:

8301 Valley Creek Road

Woodbury, Mn. 55125

Designated Representative:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: 8301 Valley Creek Road

Woodbury, Mn. 55125

Phone: 651-714-3593

Facsimile: 651-714-3501

Approved as to Form:

By: \_\_\_\_\_  
Woodbury City Attorney

**Contractor:**

By: \_\_\_\_\_

Attest \_\_\_\_\_

Address for giving notices:

License No. \_\_\_\_\_  
(Where applicable)

Designated Representative:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Facsimile: \_\_\_\_\_

**END OF SECTION**

## PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):                      SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

### CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

### BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

### CONTRACTOR AS PRINCIPAL

### SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal

\_\_\_\_\_  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
  - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
  - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
  - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
    1. Surety in accordance with the terms of the Contract; or
    2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
  - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
  - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
  - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
  - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
    1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
    2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

#### 11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address and Telephone*)

Surety Agency or Broker:

Owner's Representative (*Engineer or other party*):

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## PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

### CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

### BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

### CONTRACTOR AS PRINCIPAL

### SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal

\_\_\_\_\_  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
  - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
  - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
  - 4.2 Claimants who do not have a direct contract with Contractor:
    1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
    2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
    3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
  - 6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
  - 6.2 Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.



9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

#### 15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*)

Surety Agency or Broker:

Owner's Representative (*Engineer or other*):

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

## STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

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# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
  3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  5. *Bidder*—An individual or entity that submits a Bid to Owner.
  6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
  7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
  8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
  9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
  10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

## 1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
    - a. does not conform to the Contract Documents; or
    - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
    - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### **2.01 *Delivery of Bonds and Evidence of Insurance***

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

### **2.02 *Copies of Documents***

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

### **2.03 *Before Starting Construction***

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
  1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
  2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

#### 2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

#### 2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

#### 2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or



computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

### **ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

#### **3.01 *Intent***

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

#### **3.02 *Reference Standards***

- A. Standards Specifications, Codes, Laws and Regulations
  - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

#### **3.03 *Reporting and Resolving Discrepancies***

- A. *Reporting Discrepancies:*
  - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
  - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

### 3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
  - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
  - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

### 4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

### 4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

### 4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

### 4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

#### 4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
  1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
  2. abnormal weather conditions;
  3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
  4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

## **ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

### **5.01 *Availability of Lands***

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

### **5.02 *Use of Site and Other Areas***

#### **A. *Limitation on Use of Site and Other Areas:***

- 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
- 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

### 5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
  - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
  - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
  - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
  - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

#### 5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
  2. is of such a nature as to require a change in the Drawings or Specifications; or
  3. differs materially from that shown or indicated in the Contract Documents; or
  4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
    - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

- c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
  - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
  - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

#### 5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
  2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
    - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after



becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
  - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
    - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
    - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
    - d. Contractor gave the notice required in Paragraph 5.05.B.
  - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
  - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
  2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

## ARTICLE 6 – BONDS AND INSURANCE

### 6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

### 6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

#### 6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
  - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
  - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
  2. claims for damages insured by reasonably available personal injury liability coverage.
  3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
    - a. Such insurance shall be maintained for three years after final payment.
    - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
  2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  3. Broad form property damage coverage.
  4. Severability of interest.
  5. Underground, explosion, and collapse coverage.
  6. Personal injury coverage.
  7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
  8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
  - 1. include at least the specific coverages provided in this Article.
  - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
  - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
  - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
  - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

#### 6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

#### 6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
  - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
  - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
  - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).



5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
  6. extend to cover damage or loss to insured property while in transit.
  7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
  8. allow for the waiver of the insurer's subrogation rights, as set forth below.
  9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
  10. not include a co-insurance clause.
  11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
  12. include performance/hot testing and start-up.
  13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

#### 6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

#### 6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

## **ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

### **7.01   *Supervision and Superintendence***

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

### **7.02   *Labor; Working Hours***

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

### **7.03   *Services, Materials, and Equipment***

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
      - 3) it has a proven record of performance and availability of responsive service; and
      - 4) it is not objectionable to Owner.
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
      - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

#### 7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
  - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
  - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
  - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
    - a. shall certify that the proposed substitute item will:
      - 1) perform adequately the functions and achieve the results called for by the general design,
      - 2) be similar in substance to that specified, and
      - 3) be suited to the same use as that specified.
    - b. will state:
      - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
      - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
      - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
    - c. will identify:
      - 1) all variations of the proposed substitute item from that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

#### 7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work



#### 7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

#### 7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

#### 7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
  - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
  - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
  - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
  - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
  - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
  - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

#### 7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 7.16 *Shop Drawings, Samples, and Other Submittals*

##### A. *Shop Drawing and Sample Submittal Requirements:*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
- 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
- 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

##### 1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal;
  6. the issuance of a notice of acceptability by Engineer;
  7. any inspection, test, or approval by others; or
  8. any correction of defective Work by Owner.

- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

#### 7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

## **ARTICLE 8 – OTHER WORK AT THE SITE**

### **8.01 *Other Work***

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

## 8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
  - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
  - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
  - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

## 8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.



- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

## **ARTICLE 9 – OWNER'S RESPONSIBILITIES**

### **9.01    *Communications to Contractor***

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

### **9.02    *Replacement of Engineer***

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

### **9.03    *Furnish Data***

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

### **9.04    *Pay When Due***

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

### **9.05    *Lands and Easements; Reports, Tests, and Drawings***

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

### **9.06    *Insurance***

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

### **9.07    *Change Orders***

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

**ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION**

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

#### 10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

### **ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

#### 11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
  - 1. *Change Orders:*
    - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
    - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
  - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

#### 11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

#### 11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
  1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

#### 11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

#### 11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
  2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
  3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

#### 11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
  2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
  3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
  4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

#### 11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

### ARTICLE 12 – CLAIMS

#### 12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
  - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
  - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
  - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
  - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
  - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim



submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

## **ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### **13.01 Cost of the Work**

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
  1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
  2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
  1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

- B. *Cash Allowances*: Contractor agrees that:
  - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
  - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

### 13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
  - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
  - 2. there is no corresponding adjustment with respect to any other item of Work; and
  - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

## **ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### **14.01 Access to Work**

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### **14.02 Tests, Inspections, and Approvals**

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
  - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
  - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
  - 3. by manufacturers of equipment furnished under the Contract Documents;
  - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
  - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

#### 14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

#### 14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

#### 14.05 *Uncovering Work*

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
  - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
  - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

#### 14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

## **ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

### **15.01 Progress Payments**

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
  - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
  - 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  - 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
  - 1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
  - 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:



- a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
  - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
  - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
  - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
  - c. Contractor has failed to provide and maintain required bonds or insurance;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
  - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
  - f. the Work is defective, requiring correction or replacement;
  - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - h. the Contract Price has been reduced by Change Orders;
  - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
  - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
  - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

#### 15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

#### 15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

#### 15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
  - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

#### 15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 15.06 *Final Payment*

- A. *Application for Payment:*
  - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents;
  - b. consent of the surety, if any, to final payment;
  - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
  - d. a list of all disputes that Contractor believes are unsettled; and
  - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

**B. *Engineer's Review of Application and Acceptance:***

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

#### 15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

#### 15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. correct the defective repairs to the Site or such other adjacent areas;
  - 2. correct such defective Work;
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

## **ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION**

### **16.01 *Owner May Suspend Work***

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

### **16.02 *Owner May Terminate for Cause***

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
  - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
  - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
  - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
  - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
  - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
  - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
  - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

#### 16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for



expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

## **ARTICLE 17 – FINAL RESOLUTION OF DISPUTES**

### **17.01 *Methods and Procedures***

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
  - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
  - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
  - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
  - 2. agree with the other party to submit the dispute to another dispute resolution process; or
  - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

## **ARTICLE 18 – MISCELLANEOUS**

### **18.01 *Giving Notice***

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

### **18.02 *Computation of Times***

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

### **18.03 *Cumulative Remedies***

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

## **SECTION 00 73 05**

### **SUPPLEMENTARY CONDITIONS**

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (No. C-700, 2013 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

#### **ARTICLE 1 - DEFINITIONS AND TERMINOLOGY**

SC-1.01.A.25 Add the following language at the end of the definition of Milestone:

Specific milestones, if any, are described in Section 00 52 10.

SC-1.01.A.40 Delete paragraph 1.01.A.40 in its entirety and replace with the following:

40. *Substantial Completion* - Substantial Completion shall be as defined in the Agreement.

SC-1.02 Add the following new paragraph immediately after Paragraph 1.02.F:

G. The Specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

#### **ARTICLE 2 - PRELIMINARY MATTERS**

SC-2.02A Delete Paragraph 2.02A in its entirety and replace with the following:

SC-2.02.A Owner shall furnish to Contractor 1 printed copy and 1 electronic (PDF) version of the Contract Documents. Additional printed copies may be obtained as directed in the Advertisement for Bids. Limitations of use of electronic and printed documents are described in the Instructions to Bidders, and General Conditions.

#### **ARTICLE 5 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS**

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.B:

- C. Reports of explorations and tests of subsurface conditions at or contiguous to the Site known to Owner are identified in Division 00.
- D. The reports and drawings identified above are not part of the Contract Documents, but the "technical data" contained therein upon which Contractor may rely, as expressly identified and established above, are incorporated in the Contract Documents by reference. Contractor is not entitled to rely upon any other information and data known to or identified by Owner or Engineer.

- E. Copies of reports and drawings identified in SC-5.03.C and SC-5.03.D that are not included with the Bidding Documents may be examined at the office of Engineer during regular business hours.
- SC-5.05.A Add the following new item immediately after Item 2.d:
- 3. The subsurface utility information on the Drawings is utility quality level D, unless otherwise noted. This quality level was determined according to the guidelines of CI/ASCE 38-.2, entitled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data."
- SC-5.06 Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:
- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.
  - B. Not Used.

## **ARTICLE 6 - BONDS AND INSURANCE**

- SC-6.01 Add the following new paragraph immediately after Paragraph 6.01.F:
- G. Separate Performance and Payment Bonds should be submitted utilizing EJCDC Form C-610 and C-615 (2013 Edition) or a similar bond form if approved by Owner.
- SC-6.02.D Delete Paragraph 6.02.D in its entirety.
- SC-6.03 Add the following new paragraph immediately after Paragraph 6.03.I.2:
- a. Commercial general liability insurance in an amount of not less than \$1,000,000 each occurrence combined single limit for bodily injury/property damage and \$1,500,000 aggregate. Such policy shall include coverage for premises/operations; products/completed operations; contractual liability; independent contractors; personal injury; explosion/collapse/underground (XCU); and a general aggregate on a "per project" basis. The insurance must include the Owner and Engineer as an "additional insured." The insurance policy to which this additional insured endorsement is added shall be on a primary basis, and the additional insured's policy shall be non-contributory. The additional insured endorsement(s) must be ISO forms CG 2010 and CG 037 (10-01 editions on both) or their equivalent and provide products completed operations coverage. Products/completed operations coverage shall remain in effect for at least 2 years from the date of acceptance of the Project.
  - b. Automobile liability in an amount of not less than \$1,500,000 combined single limit bodily injury/property damage. Such policy shall include coverage for all owned, non-owned and hired automobiles. The insurance must include the Owner and Engineer as an "additional insured."
  - c. If design services are included in this Contract, professional liability in the amount of not less than \$500,000 each claim and \$1,000,000 aggregate shall be required. This insurance shall be maintained for a minimum of 2 years from Substantial Completion.
  - d. Workers compensation insurance in an amount of not less than Coverage A - Statutory, and Coverage B - \$500,000 each accident/\$500,000 disease policy limit/\$500,000 disease each employee limit.

- e. Umbrella excess liability insurance in an amount of not less than \$1,200,000 each occurrence and \$1,200,000 aggregate. Umbrella excess liability shall be a combined single limit which shall provide excess liability insurance over Commercial General Liability, Comprehensive Automobile Liability, Employers Liability, and Design Liability. The insurance must include the Owner and Engineer as an "additional insured"
- f. If the Contractor's work involves any hazardous substance, a separate pollution liability insurance policy shall be required. The amount of insurance shall, at a minimum be issued in an amount of not less than \$1,000,000 each occurrence and \$3,000,000 aggregate. The Owner shall also be included as an additional insured.
- g. Any policy obtained and maintained under this clause shall provide that it shall not be cancelled, materially changed, or not renewed without 30 days prior notice thereof to the City.

SC-6.05.A Amend the first sentence of Paragraph 6.05.A to read:

- A. Contractor shall purchase and maintain during the entire construction period a Builders Risk Property Insurance Policy in the amount of the full replacement cost of the entire Work at the Site. The insurance policy shall comply with the provisions of Paragraph 6.05.A1 through 5.06.A13. A minimum deductible of \$1,000 each claim shall apply to this insurance and the risk of loss of the applicable deductible shall be born by Contractor, subcontractor, or others suffering such loss. In addition, the provisions of Paragraphs 6.05.D and 6.06 shall apply with the exception that Contractor shall act as fiduciary for the insured's as their interest may appear and adjust the loss with the insurance company.

SC-6.05.A Add the following new item immediately after Item 6.05.A.13:

- 14. The Builder's Risk Insurance required herein shall apply to projects involving construction of structures and buildings only. The requirements of this Section shall be waived on projects involving only underground utilities, grading, street improvements, and similar construction work but any damage or loss to property shall be at the sole responsibility of Contractor until final acceptance of the Work.
- 15. Comply with the requirements of Paragraph 6.05.B of the General Conditions.

## **ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES**

SC-7.02.C Add the following new item:

- C. No Work shall be done between 10 P.M. and 6 A.M. any day of the week.

SC-7.06.I Add the following language to the end of Paragraph 7.06.O.2:

In accordance with Minnesota Statute 471.425, the Contractor shall pay any subcontractor within 10 days of the Contractor's receipt of payment from the Municipality.

SC-7.06 Add the following new paragraphs immediately after Paragraph 7.06.O:

- P. Pursuant to Minnesota Statute, Contractor shall be fully responsible to pay subcontractors, suppliers, and other entities within 10 days of the Contractor's receipt of payment for undisputed services provided by the subcontractor, supplier, or other entity. Contractor shall pay interest of 1-1/2 percent per month or any part of a month to the

subcontractor, supplier, or other entity on any amount not paid on time to the subcontractor, supplier, or other entity. The minimum monthly interest penalty payment for an unpaid balance of \$100 or more is \$10. For an unpaid balance of less than \$100, the Contractor shall pay the actual penalty due to the subcontractor, supplier, or other entity. A subcontractor, supplier, or other entity who prevails in a civil action to collect interest penalties from a Contractor must be awarded its costs and disbursements, including attorney's fees included in bringing the action.

SC-7.08.A Amend the first sentence of Paragraph 7.08.A by replacing the words "Contract Documents" with the words "Division 01."

#### **ARTICLE 11 - AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

SC-11.01.A.2 Amend the second sentence of Paragraph 11.01.A.2 by replacing the words "30 days" with the words "10 days." Amend the third sentence of Paragraph 11.01.A.2 by replacing the words "60 days" with the words "30 days".

SC-11.06.A.1 Amend the first sentence of Paragraph 11.06.A.1 by replacing the words "30 days" with the words "10 days".

#### **ARTICLE 13 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

- E. The quantities for each Bid Item shown in the Bid Form have been estimated as accurately as possible based on the best information available at the time of preparation of these Construction Documents. Payment for the Bid Items on a Unit Price basis under this Contract shall be on the basis of quantities actually used in the construction, regardless of the estimated quantities shown in the Bid Form. No revision to the Contract Unit Prices for the Bid Items shall be considered or allowed due to variations of the actual quantities from the estimated amounts. Certain quantities may be expected to vary more than others, such as excavation, bituminous mixture, erosion control, and restoration.

#### **ARTICLE 14 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

SC-14.05.C.2 Amend the second sentence of Paragraph 14.05.C.2 by replacing the words "30 days" with the words "10 days".

#### **ARTICLE 15 - PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

SC-15.01.C.5 Delete Paragraph 15.01.C.5 and replace with the following:

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2 or, Contractor has failed to make acceptable submittals in accordance with the accepted schedules.

SC-15.08.A Amend the first sentence in Paragraph 15.08.A by replacing the words "one year" with the words "two years".

## **ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION**

SC-16.01.A Amend the third sentence of Paragraph 16.01.C.2 by replacing the words “30 days” with the words “10 days”.

## **ARTICLE 17 - FINAL RESOLUTION OF DISPUTES**

SC-17.01.B Delete Paragraph 17.01.B in its entirety and insert the following in its place:

- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
1. give to the other party written notice of intent to submit the claim to a court of competent jurisdiction, or
  2. agree with the other party to submit the claim to another dispute resolution process.

SC-17.01.C Add the following new paragraph immediately after Paragraph SC-17.01.B:

- C. Notwithstanding any applicable statute of limitations, a party giving notice under Paragraph SC-17.01.B.1 shall commence an action on the claim within 1 year of giving such notice and within the period of any applicable statute of limitation or repose. Failure to do so shall result in the claim being time-barred and Engineer’s action or denial shall become final and binding.

## **ARTICLE 18 - MISCELLANEOUS**

SC-18 Add the following new paragraphs immediately after Paragraph 18.08:

18.09 *Equal Opportunity Compliance:*

The City of Woodbury is an Equal Opportunity and Affirmative Action employer. The Contractor with the City is required to follow and conform to applicable federal, state, and City laws as they apply to the Contractor’s duty for Equal Opportunity and Affirmative Action employment. It is the Contractor’s responsibility to insure compliance with Equal Opportunity and Affirmative Action requirements. Failure to comply with applicable Equal Opportunity and Affirmative Action employment requirements may lead to Contractor sanctions.

18.10 *Audit Clause:*

The Contractor agrees that its books, records, documents, and accounting procedures and practices, that are relevant to the contract or transaction, are subject to examination by the Owner and either the legislative auditor or the state auditor, as appropriate, for a minimum of six years. If the Owner requests that the state auditor examine the books, records, documents, and accounting procedures and practices of the Contractor pursuant to this subdivision, the Owner shall be liable for the cost of the examination. If the Contractor requests that the state auditor examine all books, records, documents, and accounting procedures and practices related to the contract, the Contractor shall be liable for the cost of the examination.

18.11 *Non-Discrimination Clauses:*

The Contractor agrees:

(1) that, in the hiring of common or skilled labor for the performance of any work under any contract, or any subcontract, no contractor, material supplier, or vendor, shall, by reason of race, creed, or color, discriminate against the person or persons who are citizens of the United States or resident aliens who are qualified and available to perform the work to which the employment relates;

(2) that no contractor, material supplier, or vendor, shall, in any manner, discriminate against, or intimidate, or prevent the employment of any person or persons identified in clause (1) of this section, or on being hired, prevent, or conspire to prevent, the person or persons from the performance of work under any contract on account of race, creed, or color;

(3) that a violation of this section is a misdemeanor; and

(4) that this contract may be canceled or terminated by the state, county, city, town, school board, or any other person authorized to grant the contracts for employment, and all money due, or to become due under the contract, may be forfeited for a second or any subsequent violation of the terms or conditions of this contract.

18.12 *Possession of Firearms on City of Woodbury Premises:*

Unless specifically required by the terms of this contract, no provider of services pursuant to this contract, including but not limited to employees, agents or subcontractors of the Vendor or Contractor shall carry or possess a firearm on City of Woodbury premises or while acting on behalf of the City of Woodbury pursuant to the terms of this agreement. Violation of this provision shall be considered a substantial breach of the Agreement; and, in addition to any other remedy available to the City of Woodbury under law or equity is grounds for immediate suspension or termination of this contract.

**END OF SECTION**



**SECTION 01 20 00**  
**PRICE AND PAYMENT PROCEDURES**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes:
  - 1. Administrative and procedural requirements for pricing of Work and request for payment procedures.

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. All Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

1.03 BID UNIT PRICES

- A. Provide access and assist Engineer in determining actual quantities of Bid Unit Price work.
- B. Provide documentation to substantiate Bid Unit Price work.
- C. If the Contractor delivers and places more of any material that is paid for on a Bid Unit Price basis than is required to perform the Work and thereby causes the materials to be wasted, the quantity wasted will be deducted from the final measurement for that Bid Item.

1.04 PAYMENT PROCEDURES

- A. Engineer will provide initial Application for Payment Form at the Preconstruction Conference.
- B. Submit 1 preliminary copy of progress payment application for review, consistent with Article 15 of the General Conditions. Submit 4 signed copies of Application for Payment to Engineer prior to the dates identified at the Preconstruction Conference.
- C. Attach the following supporting documentation, in addition to the requirements of General Conditions Article 14:
  - 1. Documentation to substantiate Bid Unit Price work.
  - 2. Updated construction schedule consistent with Section 01 33 00.
- D. Prior to the processing of any and all payments to the Contractor pursuant to this Contract, compliance with Woodbury Finance Department regulations on the completion and filing of W-9 forms and other IRS and Minnesota Department of Revenue taxing forms is required.

**PART 2 PRODUCTS**

Not Used.

### **PART 3 EXECUTION**

Not Used.

**END OF SECTION**

## **SECTION 01 31 00**

### **PROJECT MANAGEMENT AND COORDINATION**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. General requirements for overall Project coordination.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. All Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 PROJECT COORDINATION**

- A. Coordinate all Work with the Engineer and Public Works Director. The Public Works Director and staff are located at the Woodbury City Hall at 8301 Valley Creek Road. Their telephone number is 651-714-3593. Regular office hours are 8 A.M. to 4:30 P.M.
- B. Coordinate the Work of the Contract and the Work of others relating to the Project. Work with others to cause the efficient and timely completion of the Work. These responsibilities include, among others, the following:
  - 1. Coordinate activities of all sub-contractors.
  - 2. Inform emergency services (Police, Fire), Post Office, and Schools of traffic situations as appropriate to Project circumstances.
  - 3. Inform City Public Works Department of Project schedule and upcoming activities that will affect their operation.
  - 4. Inform non-municipal utilities (gas, telephone, electric, etc.) of Project schedule to allow for planning of any activities they wish to coordinate with the Project.
  - 5. Maintain and coordinate access needs of adjacent properties.

##### **1.04 UTILITIES**

- A. Notify Gopher State One Call before starting construction in a given area requesting utility locates in the Site:
  - 1. Engineer has requested information at time of construction document preparation on existing private utilities via design locate request through the Gopher State One Call Program.
  - 2. The original version of the information supplied by the utilities is available for viewing at the office of the Engineer.
- B. Known Information On Private Utilities: Known information regarding the private utilities is depicted on the Drawings and information supplied by utility companies can be viewed at the office of the Engineer by request.
- C. Project Utility Sources: Coordinate Work with the following utility owners:
  - 1. City of Woodbury Public Works      651-714-3720
  - 2. Gopher State One Call                651-454-0002

- D. Owner requires a 48-hour notice for all utility interruptions.
- E. Coordinate the relocation or protection of all existing facilities. Any costs for such Work shall be the responsibility of the Contractor.

#### 1.05 PERMITS

- A. Comply with the stipulations of the following permits, which have been applied for and will be furnished by the Owner:
  - 1. Minnesota Pollution Control Agency (MPCA) Permit for Sanitary Sewer Extensions.
  - 2. Minnesota Department of Health (MDH) Permit for Water Main Extensions.
  - 3. MPCA Stormwater Discharges Associated With Construction Activities NPDES General Permit.
- B. Apply for, obtain, and comply with the provisions of the following permits, which the Owner will waive the permit application fee:
  - 1. City Building Permit.
- C. Apply for, obtain, and comply with other permits, licenses, and approvals which may be required for the Project.

#### 1.06 SURVEYING AND CONSTRUCTION OBSERVATION

- A. Provide Engineer a minimum of 48-hour notice in advance of the need for establishing lines, grades, measurements, grade checks, and observation of Work.
- B. Engineer will furnish a Resident Project representative consistent with Paragraph 10.03 of the General Conditions.
- C. The Contractor is responsible for grades and elevations for pedestrian ramps.

#### 1.07 PROJECT MEETINGS

- A. Administrative Requirements:
  - 1. Project Superintendent or persons designated by the Contractor to attend and participate in the Project meetings shall have all required authority to commit the Contractor to solutions agreed upon in the Project meetings.
  - 2. Engineer will set the time, sites, and prepare the agenda for the meetings.
  - 3. Engineer will prepare meeting minutes and distribute 1 copy to Contractor. Notify Engineer of inaccuracies or discrepancies in the meeting minutes within 5 calendar days of receipt of the minutes.
  - 4. The attendance and cooperation of subcontractors and suppliers may be required.
- B. Preconstruction Conference:
  - 1. Provisions for the Preconstruction Conference are set forth in the General Conditions.
  - 2. Requirements for preconstruction submittals are set forth in the General Conditions. Submittal procedures shall be consistent with Section 01 33 00.
- C. Progress Meeting Procedures:
  - 1. Weekly Status Meetings will be held during weeks when construction activity is occurring on the Project. The meetings will take place at Woodbury City Hall or other location agreed upon at the preconstruction meeting. Day and time will be determined at the preconstruction meeting. If no Work is occurring, no meeting will be required:
    - a. Weekly Status Meetings are anticipated to be 30 to 60 minutes in length.

- b. Furnish a detailed schedule of work for the following week and provide an update on construction activity from the previous week.
- c. Developers, subcontractors, private utilities, and others may attend to communicate Project issues.

## **PART 2 PRODUCTS**

Not Used.

## **PART 3 EXECUTION**

Not Used.

**END OF SECTION**

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## **SECTION 01 33 00**

### **SUBMITTAL PROCEDURES**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. General procedures and requirements for submittals during the course of construction.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. All Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 SEQUENCING AND SCHEDULING**

- A. Schedule submittals consistent with the Contractor's schedule of shop drawings.

#### **PART 2 PRODUCTS**

Not Used.

#### **PART 3 EXECUTION**

##### **3.01 CONSTRUCTION SCHEDULE**

- A. Submit preliminary schedule and progress schedule consistent with the General Conditions.
- B. Prepare schedules on 11 inch by 17 inch sheets showing overall sequence of construction. Organize the schedule by work activity. Identify separate stages of each work activity:
  - 1. List work items in chronological sequence. Show beginning and completion dates of each activity. Include all activities with an estimated duration of 3 days or longer.
  - 2. Format schedule as a horizontal bar chart. Provide separate bars for each activity or trade.
  - 3. Provide space for revisions and notations.
  - 4. Identify interrelations between activities.
  - 5. Include estimated times for preparation of submittals by Contractor, processing and review of submittals by Engineer, fabrication, delivery, installation, testing, start-up, instruction of Owner, and clean-up.
- C. As Work progresses, revise, update, and resubmit schedule as requested by Engineer. At a minimum, update schedule with each Application for Payment. Show all activities started or finished since previous schedule was submitted and show percentage of completion for each activity.

### 3.02 EMERGENCY CONTACT LIST

- A. Before any Work at the Site is started, submit a typed list on 8.5 inch by 11 inch paper outlining 24-hour on-call contacts for the Project. This list shall include the Contractor's safety representative, key representatives from the Contractor, subcontractors, and suppliers. Include the following information for each contact:
  - 1. Company name.
  - 2. Contact person(s).
  - 3. Local and mobile phone numbers.
  - 4. Fax number.

### 3.03 SHOP DRAWINGS AND MANUFACTURERS' INFORMATION

- A. Conform to the requirements of the General Conditions, except as modified herein.
- B. The minimum sheet size shall be 8.5 inches by 11 inches. Non-legible copies will not be reviewed.
- C. Submit a minimum of 3 copies of shop drawings, plus the quantity of copies the Contractor wants returned. Each copy shall contain the following information:
  - 1. Date of submission and date of any previous submittals.
  - 2. Project Title.
  - 3. Names Of: Contractor, subcontractor, supplier, and manufacturer.
  - 4. Identification of product and Specification Section number.
  - 5. Identification of revisions from previous submittals.
  - 6. A 4 inch by 4 inch blank space for the Engineer's stamp.
- D. Engineer's review will be in conformance with the requirements of the General Conditions, except as modified herein.
- E. Engineer will stamp shop drawings and indicate requirements for Contractor's review or re-submittal as follows:
  - 1. "Approved" – Appears that items covered by the submittal will, after installation or incorporation into the Work, conform to the Contract Documents and appears to be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
  - 2. "Approved as Noted" – Appears that items covered by the submittal will, after installation or incorporation into the Work, conform to the Contract Documents and appears to be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, except as noted by Engineer.
  - 3. "Revise and Resubmit" – Appears that items covered by the submittal will not, after installation or incorporation into the Work, conform to the Contract Documents and will not be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Work cannot proceed until the submittal is revised and resubmitted conforming to the re-submittal procedures described in the General Conditions.
  - 4. "Rejected" – Work covered by the submittal is not complete or it appears that items covered by the submittal will not, after installation or incorporation into the Work, conform to the Contract Documents and will not be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Contractor shall conform to the re-submittal procedures described in the General Conditions.
- F. Engineer will return reviewed submittals via email.



### 3.04 MATERIAL AND SAFETY DATA SHEETS

- A. Furnish Owner with current copies of Material Safety Data Sheets for all chemicals and products on Site.

**END OF SECTION**

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**SECTION 01 40 00**  
**QUALITY REQUIREMENTS**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes:
  - 1. Information required for conformance to regulatory requirements.
  - 2. Quality assurance.
  - 3. Procedures to measure and report the quality and performance of the Work.

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. All Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

1.03 REFERENCE STANDARDS

- A. Whenever reference is made to the Minnesota Department of Transportation Specifications, such reference shall mean "Standard Specifications for Construction" 2018 Edition (MnDOT Spec.) and all subsequent revisions and supplements. The word "Engineer" is understood to refer to the Engineer for the Owner.

1.04 SUBMITTALS

- A. Prior to start of Work, submit testing laboratory name for various specified tests for approval by Engineer.
- B. Laboratory test results or analysis.
- C. Manufacturer's certificates of quality control or performance.

1.05 WORKMANSHIP

- A. Comply with industry standards of the region, except where more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

1.06 TESTS AND INSPECTIONS

- A. Conform to the requirements of the General Conditions, except as modified herein.
- B. Notify Engineer 48 hours prior to expected time for operations requiring tests and inspections.
- C. Provide incidental labor and facilities to obtain and handle samples at Site or source, transport samples to laboratory, and facilitate tests and inspections for storing and curing of test samples.
- D. Owner shall pay for all required tests, except as indicated in the Specifications:
  - 1. If any test fails to meet requirements, reimburse Owner for cost of all subsequent tests to ensure compliance.

- E. Notify Engineer of pit and scale location and other correlated items prior to beginning Work.
- F. Following substantial completion of the project and in accordance with Standard General Conditions of the Construction Contract, EJCDC C-700, Article 15.04, the Engineer and Owner will perform a Final Inspection of the work performed under the contract. Based on that Inspection 1 initial Inspection Notice Report (INR) will be prepared. Contractor shall notify Engineer when items listed in INR have been completed. The Engineer will inspect Contractor's work a second time to verify the items in the initial INR have been completed. If there are items still unacceptable to the Owner/Engineer, a second INR will be prepared. All costs for Owner's/Engineer's time to prepare the second and, if needed, subsequent INRs and to verify that the work has been completed will be the Contractor's responsibility.

#### 1.07 LABORATORY REPORTS

- A. After each inspection and test, submit 3 copies of Laboratory Report to Engineer.
- B. Include: Date issued, Project title and number, name of inspector, date and time of sampling or inspection, identification of product and Specifications Section, location in the Project, type of inspection or test, date of test, results of tests, and conformance with Contract Documents.

#### 1.08 LABORATORY RESPONSIBILITIES

- A. Test samples and perform field tests.
- B. Provide qualified personnel. Cooperate with Engineer and Contractor in performance of services.
- C. Ascertain compliance with the requirements of the Contract Documents.
- D. When requested by Engineer, provide interpretation of test results.

#### 1.09 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop Work.

#### 1.10 MANUFACTURER'S CERTIFICATES

- A. If requested by Engineer, submit manufacturer's certificate with shop drawings certifying that products meet or exceed specified requirements executed by responsible officer.

#### 1.11 MANUFACTURER'S FIELD SERVICES

- A. Provide qualified representative to observe field conditions; conditions of surfaces and installation; quality of workmanship; start-up of equipment; and test, adjust, and balance of equipment.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

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## SECTION 01 50 00

### TEMPORARY FACILITIES AND CONTROLS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes:
  - 1. Temporary utilities and miscellaneous temporary facilities required during construction.
- B. Products furnished but not installed under this Section or products installed but not furnished under this Section.
- C. Related Sections:
  - 1. Section 01 33 00 – Submittal Procedures.
  - 2. Section 33 10 00 – Water Utilities.
  - 3. Section 33 12 12 – Water Services.

##### 1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Mobilization: Measurement is Lump Sum. This will be considered payment in full for all work and costs of this Bid Item for the entire Project. Partial payment of the Lump Sum Bid Item "Mobilization" will be made using a percentage based on the following, except if the contract unit price for mobilization exceeds 5 percent of the total original contract amount, the Owner may withhold (on any partial estimate) the portion in excess of 5 percent until the Contractor earns at least 95 percent of the original contract amount:

	Cumulative Percent of Mobilization Item Paid
First Partial Payment	50
Percent of original contract amount earned - 25	70
Percent of original contract amount earned - 50	90
Percent of original contract amount earned -100	100

- 2. Traffic Control: Measurement is Lump Sum. This shall be considered payment in full for all labor, equipment, and materials associated with the required Traffic Control devices for the entire Project. This Bid Item shall include but not be limited to furnishing, installing, and relocating the Traffic Control due to various road closures, daily maintenance, and ultimate removal of all such devices used over the duration of the Contract or as directed by the Engineer. Partial payment of the Lump Sum Item "Traffic Control" will be made using a percentage based on the following, except if the contract unit price for traffic control exceeds 5 percent of the total original contract amount, the Owner may withhold (on any partial estimate) the portion in excess of 5 percent until the Contractor earns at least 95 percent of the original contract amount:

	Cumulative Percent of Traffic Control Item Paid
First Partial Payment	50
Percent of original Contract amount earned – 25	70
Percent of original Contract amount earned – 50	90
Percent of original Contract amount earned – 100	100

3. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.).
- B. The Minnesota Manual on Uniform Traffic Control Devices (MMUTCD), including the Field Manual on Temporary Traffic Control Zone Layouts – Latest edition.
- C. Minnesota Department of Transportation Traffic Engineering Manual.

### 1.04 SUBMITTALS

- A. Construction Staging Plan consistent with Section 01 33 00, including the following information:
  - 1. Sequence of construction and traffic control.
  - 2. Streets closed or restricted during any stage of construction.
  - 3. Provisions for routing any detoured traffic as permitted.
  - 4. Specific signs, striping, and other traffic control devices to be utilized.
- B. Traffic Management Plan consistent with Section 01 33 00, including the following information:
  - 1. Haul and access routes.
  - 2. Permits or applications required by local authorities.
  - 3. Temporary facilities required.

## PART 2 PRODUCTS

Not Used.

## PART 3 EXECUTION

### 3.01 MOBILIZATION

- A. Move personnel, equipment, materials, and all other items required to complete the Work at the Site.
- B. Establish Contractor offices, building, or other facilities necessary for Work on the Project.
- C. Temporarily hold or relocate utilities and any miscellaneous structures, such as signs, power poles, guy wires, and mailboxes disturbed.



### 3.02 STORM WATER POND VALVES

- A. To be operated by City personnel only.

### 3.03 TEMPORARY WATER FOR CONSTRUCTION AND USE OF OWNER'S WATER SYSTEM

- A. Regulations of the Minnesota Department of Health as adopted by the City of Woodbury prohibits the indiscriminate use of the City's water hydrants by persons other than City personnel.
- B. No direct connection will be allowed from a hydrant to a tank truck or watering vehicle or hose. Contractor must provide a backflow preventer or fill pipe air gap equal to 2 times the diameter of the fill pipe or hose.
- C. Clean and thoroughly disinfect all containers and testing equipment to eliminate the possibility of contamination of the system.
- D. Disinfect water mains and services consistent with Section 33 10 00 and Section 33 12 12.
- E. In addition to these regulations, comply with requirements for installation and testing of City water mains and services as described below:

Phase 1: Utility projects consisting of sanitary sewer, water main, and storm sewer improvements:

1. Step 1 - Open Connections to Existing Mains and/or Fittings:

- a. Contractor schedules shutdown and contacts City Water Department a minimum of 48 hours prior to performing Work. At this time, the Contractor is responsible to notify the City Fire Department of the intended shutdown. Contractor must abide with specific requirements for the Project that limits or defines certain hours that the shutdown maybe be performed.
- b. If water service is to be turned off, the Contractor is responsible to provide written notification to all affected property owners and customers at least 48 hours prior to the actual loss of service.
- c. The City Water Department must open and close the existing valves for this part of the operation. If required, the City will be responsible for flushing the existing mains after the connection is completed; however, the Contractor shall assist the City as necessary.

2. Step 2 - Filling Newly Installed Water Mains Prior to Service Installation:

- a. Contractor contacts City Water Department a minimum of 48 hours prior to performing Work. Engineer Representative reviews with the Contractor the sequence of lines to be filled and which hydrants to open to eliminate trapped air. Taps of 1 inch diameter may be required in dead end plugs to relieve air from the system as part of the Project.
- b. After the Contractor notifies the City Water Department, the Contractor and **Engineer Representative** operate valve to slowly fill the mains.
- c. When filling water mains 12 inches and larger, the City Water Department must be present.
- d. Contractor is responsible to verify that all existing valves are off and that untested water is not able to enter the City system. The Contractor is further responsible to have all new valves in their system open to assure that all new mains are filled but that the water is contained within the new system

3. Step 3 - Water Service Installation:

- a. All corporation stops shall be tapped with the main under water pressure.
- b. Contractor is responsible to open all corporation stops and curb stops to bleed air and flush any dirt from the copper water line. Afterwards, the Contractor shall close the curb stop and shall crimp the end of the short tail section.

During the service installation activity, the Contractor opens and closes existing main valve as necessary to maintain pressure for tapping and bleeding service lines only. The **Engineer Representative** must be present at the time the Contractor re-pressurizes the mains.

4. Step 4 - Pressure and Conductivity Testing:
    - a. Pressure and conductivity testing shall be performed as per the Contract Specifications and shall be performed in that order to assure mains are full of water for conductivity testing.
    - b. All service lines shall be in place and on before the pressure test is administered.
    - c. Document and provide the City with static pressure readings obtained during the pressure testing procedure.
  5. Step 5 - Flushing of Water Mains for Bacteria Test:
    - a. Contractor contacts City Water Department a minimum of 48 hours prior to performing Work. Engineer Representative reviews with Contractor the sequence of lines and valves to operate to thoroughly flush system.
    - b. After notifying the City, the **Engineer Representative** and Contractor operate existing valve/valves for flushing.
    - c. City Water Department must be present when flushing water mains 12 inches and larger.
    - d. Contractor shall notify the Engineer Representative for the scheduling of water sample for bacteria test, which shall be pulled and tested by a certified independent testing firm. The Contractor will be required to assist the Engineer to operate valves for sampling if necessary.
  6. Step 6 - Turning On New Mains into Existing Water System:
    - a. All testing complete - pressure, conductivity, and bacteria accepted by the Engineer.
    - b. Engineer completes required documentation notifying Public Works Department, Engineering Department, and Building Inspection Department that the new system is turned on or can be scheduled to be turned on.
    - c. Engineer contacts the City Public Works Department which must be present to turn on the new system for mains 12" and larger. System shall be turned on within 14 calendar days of completion of passing tests.
    - d. Engineer Representative and Contractor together turns on the new system for mains smaller than 12". System shall be turned on within 14 calendar days of completion of passing tests.
- F. Phase 2 - Street Construction and Restoration, Landscaping Work:
1. Contractors, subcontractors, builders, or developers are not allowed to operate or connect to a City's hydrant for water usage without a hydrant use permit.
  2. City water for street construction, restoration, and landscaping work is as follows:
    - a. Hydrant Use Permit available at Public Works Department located at 2301 Tower Drive. Office hours 7 A.M. to 3:30 P.M. A deposit is required for the use of a hydrant meter and a monthly rental fee will apply. These costs will be per the current City fee schedule. The charge for water used will also be per the current City fee schedule.
    - b. If hydrant meters are not available or if the City determines the Contractors request for water warrants it, the City will designate an existing hydrant for the Contractors use. The same hydrant use permit, deposit, and water use charge will be applied, as required for the hydrant meter.
    - c. Prices and deposit amounts may change without notice.
- G. Water Restrictions: Contractor may be required to use non-potable water during a drought period. Owner will assist Contractor in locating source.

### 3.04 CONSTRUCTION FACILITIES

#### A. Sanitary Facilities:

1. Comply with all governing regulations, including safety and health codes, for sanitary fixtures and facilities.
2. Provide self-contained toilet units, or water and sewer connected temporary toilet facilities, consistent with governing regulations. Contractor may not use Owner's toilet facilities.
3. Provide and maintain adequate supply of toilet tissue, paper towels, paper cups, and similar disposable materials appropriate for each facility. Provide appropriate covered waste containers for used material.

### 3.05 TEMPORARY CONSTRUCTION

#### A. By Pass Pumping:

1. All sanitary flows shall be pumped around areas with no spillage allowed.
2. Any spill needs to be reported as required by law.

#### B. Pumping and Dewatering:

1. Provide draining, pumping, dewatering, and cleaning operations necessary to complete the Work.
2. Provide all necessary pumping to remove all surface water and groundwater from structures as required for the Work. Provide erosion control measures for discharge of water.
3. Protect Site and adjacent property to avoid damage.

### 3.06 TRAFFIC CONTROL

#### A. General:

1. Provide and maintain all traffic control devices in accordance with the approved Construction Staging Plan. All traffic control devices and other protective measures shall conform to MMUTCD, including the Field Manual on Temporary Traffic Control Zone Layouts – Latest edition.
2. Do not park vehicles as to obstruct a traffic control device. The parking of workers' vehicles will not be allowed within the Project limits, unless so approved by the Engineer.
3. Do not store materials or equipment within 30 feet of through traffic, unless approved by the Engineer. If materials or equipment must be stored within 30 feet of through traffic, the Contractor shall provide barricades or barriers, as directed by the Engineer, to warn and protect traffic.
4. Conduct Work in a manner that will allow access to all properties within and adjacent to the Project by fire, police, and emergency vehicles.
5. Maintain all unpaved surfaces. The surface shall be watered and bladed as directed by the Engineer.
6. Remove traffic control devices at the conclusion of the Work.
7. Flaggers are required to protect construction vehicles during unloading of construction materials. Conform to the requirements of the MMUTCD, the Flagging Handbook included in the Field Manual for Temporary Traffic Control Zone Layouts, and the following: while on duty flaggers shall wear hard hats and reflectorized florescent orange vests; and flaggers shall be fully clothed when on duty with shirt or blouse, slacks or trouser, and sturdy shoes.
8. Protect work at all times, including during the structure adjustment work.
9. Provide access for emergency vehicles and busses to all residences at all times.

#### B. Traffic Control Devices:

1. Daily inspect and insure that all traffic control devices required by the construction are in accordance with the MMUTCD. Any discrepancy between the actual devices in use and the required devices shall be immediately rectified. At least 1 nighttime inspection shall be made each week.

2. Furnish names, addresses, and phone numbers of at least 3 individuals responsible for the placement and maintenance of traffic control devices. At least 1 of these individuals shall be "on call" 24 hours per day, 7 days per week during the time any traffic control devices furnished and installed by the Contractor are in place.
  3. Respond to any request from the Engineer to improve or correct the usage of traffic control devices on or related to this Project within 1 hour of the time of notification.
  4. Keep all traffic control signs and devices in a legible condition. This shall include but not be limited to removing grime and dust deposited on any device by traffic, natural causes, or when requested by Engineer.
  5. Store at least 10 extra Type 1 barricades with flashers, 5 extra Type III barricades, and 10 extra drums, at a convenient location within the Project limits for use in an emergency, as approved by the Engineer. No direct compensation will be made to the Contractor for furnishing and erecting these traffic control devices.
- C. Place traffic control with flashers around areas disturbed by removal and replacement of utility structures and concrete curb and gutter:
1. Place at least one Type 1 barricade with flasher or barrel with flasher per panel of curb removed.
- D. Establish and maintain advisory signs at all entrances to Site:
1. Signs shall state "Construction Zone" and "Proceed at Own Risk" in black letters on orange background.
- E. Prior to disturbing any existing trail or sidewalk, place Type 3 barricade with "Sidewalk Closed" sign on each side of the disturbed area.
- F. Closure of a roadway using Type III barricades will require a sufficient number of barricades to span the entire roadway width, at the discretion of the Engineer.

### 3.07 TEMPORARY BARRIERS AND ENCLOSURES

- A. Temporary Barriers:
1. Provide temporary covers, enclosures, markers, and barriers as necessary to protect Work.
  2. Promptly repair any damage to the Site caused by removal of temporary fencing, including potholes. During removal, at no time shall the Work remain unattended if a dangerous condition exists because of incomplete removal or Site requiring repair.
- B. Temporary Fence:
1. Install as shown on the Drawings.
  2. Maintain and repair fence throughout the duration of the Project.
  3. Provide Owner and Engineer with keys or combinations to any locks that may be used to secure fencing gates.

### 3.08 RESTRICTIONS

- A. Temporary stockpiling of materials or debris on any City street overnight is not allowed. Proper traffic control is required for stockpiling during the day.
- B. Overnight parking of equipment will not be allowed on any City street. Proper traffic control is required for parking during the day.

## END OF SECTION

## **SECTION 01 54 28**

### **EQUIPMENT RENTAL**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Furnishing labor and/or specific equipment with operators as required.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Equipment:
    - a. Measurement will be by time in hours and will only include actual working time and travel time within the Project limits for each equipment type.
    - b. Payment shall include one operator and active equipment as required. Payment for labor and equipment shall be at the Contract unit price as listed on the Bid Form. All associated work items shall be considered incidental.
  - 2. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 PERFORMANCE REQUIREMENTS**

- A. All equipment and accessories shall be fully operational and in good mechanical condition.
- B. All equipment operated on bituminous or concrete surfaces shall be equipped with rubber tires or smooth street plates.
- C. Equipment provided shall be rated for, and have sufficient power to effectively complete the work as required.

#### **PART 2 PRODUCTS**

##### **2.01 EQUIPMENT**

- A. Provide the following equipment, as requested by Engineer, which meets the specific requirements and includes the accessories listed:
  - 1. Street sweeper with mechanism for picking up and containing sweepings. Power broom will not be allowed. The Street Sweeper shall have the minimum bristle length as recommended by the manufacture.
  - 2. Skidsteer (bobcat).
  - 3. Wheel-type end loader, minimum 50 hp
  - 4. Track-type dozer, minimum 80 hp
  - 5. Dump Truck, minimum tri axle with tandem drive axle assembly

### **PART 3 EXECUTION**

#### **3.01 GENERAL**

- A. Perform work as requested by Engineer.
- B. Perform street sweeping per Section 01 57 13 and 32 12 01.

**END OF SECTION**

## **SECTION 01 57 13**

### **TEMPORARY EROSION AND SEDIMENT CONTROL**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

**A. Section Includes:**

1. Managing storm water runoff and other Project related water discharges to minimize sediment pollution during construction.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

**A. Measurement and Payment:**

1. Payment at the Bid Unit Price will be considered compensation in full for all Work necessary to complete the Bid Item in full, including installation, maintenance, sediment removal, repairs, and removals.
2. Measurement will be based upon the units as listed below for Bid Items removed, abandoned, or salvaged complete as specified. No measurement will be made of any removals that are not required. The actual quantity installed multiplied by the appropriate Bid Unit Price will be compensation in full for all Work and costs of the following Bid Items. 80-percent partial payment will be made upon installation and 20-percent payment will be made upon removal and restoration:
  - a. Silt Fence: Payment will be by type. Measurement will be by the linear foot along the base of the fence, from outside to outside of the end posts for each section of fence.
  - b. Floatation Silt Fence: Payment will be by type. Measurement will be by linear foot installed.
  - c. Storm Drain Inlet Protection: Measurement will be per each, according to type furnished, installed, maintenance, including cleaning and reinstallation.
  - d. Temporary Construction Entrance: Measurement will be by the cubic yard of material furnished and installed on the Project.
  - e. Erosion Control Blanket: Payment will be by type installed. Measurement will by square yard.
  - f. Mulch: Measurement will be by the acre of material installed.
  - g. Temporary Hydraulic Matrix: Measurement will be by the acre of material installed.
  - h. Ditch Check: Payment will be by type. Measurement will be by the linear foot.
  - i. Sediment Control Logs: Payment will be by type. Measurement will be by the linear foot.
  - j. Sediment Trap: Shall be considered incidental to the Project.
  - k. Temporary Pipe Downdrains: Measurement will be by the linear foot. Payment shall include rip rap used to provide an outlet.
  - l. Bale Barrier: Measurement will be by the linear foot.
  - m. Flocculants and Polyacrylamides: Measurement will be by dry weight in pounds based on tickets submitted to the Engineer.
  - n. Flocculant Sock: Measurement will be by the each.
  - o. Rapid Stabilization Methods:
    - 1) Method 1 and 2: Measurement will be by the acre.
    - 2) Method 3: Measurement will be by the 1,000 gals.
    - 3) Method 4: Measurement will be by the square yard.

3. Water for Dust Control: Measurement will be per 1,000 gallons (Gal) applied to the street. Payment will constitute compensation in full for all Work and cost to furnish and install the Water. This Bid Unit Bid Item is intended to pay for water used for dust control only and only at those times that it is requested by either the Engineer or Owner:
  - a. Water used for the construction of the streets will be considered incidental to the Project.
4. Street Sweeper With Operator and Skidsteer (Bobcat) With Operator: Measurement shall be by the hour of equipment use, based on the actual amount of time spent cleaning street surfaces. However, if the Contractor is careless in their construction operations, they will be required to clean and sweep streets at their own expense. Payment at the Unit Price shall be considered complete compensation for all work associated with the cleaning, including water as directed by Engineer, and disposal of collected materials:
  - a. Anticipate multiple mobilizations to perform this work.
5. Erosion Control Supervisor: No measurement will be made of the various duties performed or of the number of hours required, but all such work will be construed to be included in the lump sum payment, half to be paid after 50% of the project is complete and the remainder at closeout of the project. The bid item is for providing an Erosion Control Supervisor throughout the duration of the project to perform all duties as described in Section 1.05.A.
6. When the contract Bid Item requires maintenance, partial payment for installation will be made no greater than 50 percent of the contract unit price. The remaining partial payment will be made after maintenance and final acceptance by the Engineer
7. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

B. Related Sections:

1. Section 01 33 00 - Submittal Procedures.
2. Section 32 92 00 – Turf and Grasses.

### 1.03 REFERENCES

A. Minnesota Department of Transportation "Standard Specifications for Construction" 2018 Edition (MnDOT Spec.):

1. 1717 – Air, Land, and Water Pollution.
2. 2573 – Storm Water Management.
3. 2575 – Establishing Vegetation and Controlling Erosion.
4. 2574 – Soil Preparation.
5. 3733 – Geotextiles.
6. 3882 – Mulch Material.
7. 3884 – Hydraulic Erosion Control Products.
8. 3885 – Rolled Erosion Control Products.
9. 3886 – Silt Fence.
10. 3887 – Flotation Silt Curtains.
11. 3890 – Compost.
12. 3892 – Temporary Slope Drain.
13. 3897 – Sediment Control Log.
14. 3898 – Flocculants.
15. 3911 – Calcium Chloride.
16. 3912 – Magnesium Chloride Solution.

B. MPCA's NPDES General Stormwater Permit for Construction Activity.



#### 1.04 SUBMITTALS

- A. MPCA's NPDES General Stormwater Permit for Construction Activity (MN R100001):
  - 1. NPDES permit inspection log resulting from weekly Site inspections will be prepared by the Contractor and submitted to the Engineer on a weekly basis.
  - 2. Amendments to the Stormwater Pollution Prevention Plan (SWPPP) for the Project.
  - 3. Completed form for MPCA's Notice of Termination, in conjunction with Owner.
  - 4. Provide documentation of certifications for Erosion Control Supervisor and Certified Installers that will be on this project.
- B. Contractor Prepared Schedules and Plans:
  - 1. Erosion Control Schedule: Conforming to MnDOT Spec. 1717.2.C and submitted each week that construction is active.
  - 2. Site plans in conformance with MnDOT Spec. 1717.2.D:
    - a. Submitted when requested by the Engineer.
    - b. Site plans prepared by Contractor will indicate Contractor operations, erosion and sediment control measures, and a schedule of starting and completion times.
- C. Certification and Sampling:
  - 1. Furnish a manufacturer's certification stating that the material supplied conforms to the requirements of this Section. The certification shall include or have attached typical results of tests for the specified properties, representative of the materials supplied.

#### 1.05 QUALITY ASSURANCE

- A. Erosion Control Supervisor: Provide an Erosion Control Supervisor with a valid Minnesota Construction Site Management certification, or approved equal, authorized to represent the Contractor on matters pertaining to Erosion and Stormwater Management, work in public waters, the NPDES construction storm water compliance, and available to the work site within 72 hours of initial disturbance and daily when work is taking place until final stabilization. The following list describes the duties of the Erosion Control Supervisor:
  - 1. Implements the quality control program.
  - 2. Ensures proper installation, functionality, and maintenance, clean-up, and removal of all erosion and sediment control Best Management Practices (BMP's) and in accordance with manufacturer's recommendations.
  - 3. Implements the erosion and sediment control schedule.
  - 4. Coordinates the work of subcontractors and ensures the full execution of erosion and sediment control measures for each operation and stage of the work.
  - 5. Oversees the work of subcontractors and ensures the subcontractors undertake erosion and sediment preventative measures at each stage of the work.
  - 6. Prepares the required weekly erosion control schedule and inspections with the dates and times.
  - 7. Attends construction meetings to discuss the erosion control schedule and inspections.
  - 8. Prepares the erosion and sediment control Site Management Plans as required by the contract or as directed by the Engineer.
  - 9. Provides for erosion and sediment control methods for temporary work not shown on the plans.
  - 10. Ensures effective preventative BMP's are in place, recommends changes to the SWPPP for the Engineer's approval, and amends the SWPPP to document changes.
  - 11. Ensures acquisition of and compliance with applicable permits for borrow pits, dewatering, and temporary work in rivers, lakes, and streams.
  - 12. Ensures the full installation of erosion and sediment control before suspension of the work.

13. Coordinates with federal, state, and local regulatory agencies on resolution of erosion and sediment control issues resulting from the work.
  14. Ensures that proper clean-up occurs from vehicle tracking on paved surface locations where sediment leaves the project.
  15. Ensures daily compliance with environmental laws, permits, and SWPPP narrative requirements.
  16. Ensures the certification of installers for operations in accordance with 1.05.B Certified Installers.
- B. Certified Installers: Provide at least one certified installer with a valid certification obtained through the University of Minnesota Erosion Control Inspector/Installer Certification program, or approved equal to install or direct installation of erosion or sediment control practices as listed below:
1. Seeding.
  2. Sodding.
  3. Mulching.
  4. Silt Fence or other perimeter sediment control device installations.
  5. Rolled Erosion Control Practices (RECP) installation.
  6. Hydraulic erosion control product installation.
  7. Silt curtain installation.
  8. Ditch check installation.
  9. Compost installation.

If the Contractor fails to provide the required certified installer, the Engineer may reject the work as unauthorized.

- C. Project disturbs 1 or more acres of total land area. Co-submittal with the Owner of a completed NPDES application form for the MPCA's General Stormwater Permit for Construction Activity and the appropriate fees to the MPCA is required. Engineer will complete the online application and fees will be paid by the Owner.

## 1.06 SEQUENCING AND SCHEDULING

- A. Install sediment control measures prior to grading activities.
- B. Schedule and coordinate the Work so that permanent erosion and sediment control BMPs, such as basin construction, rip rap placement, and permanent seeding, are directly incorporated into the supplement permanent erosion and sediment control BMPs with temporary BMPs. Place temporary BMPs when permanent erosion control cannot be achieved. Coordinate construction operations so that erosion and sediment control measures (permanent or temporary) are installed and maintained concurrently with the rest of the Work of the Project.
- C. Coordinate and schedule the Work of subcontractors such that erosion and sediment control measures are fully executed for each operation and in a timely manner over the duration of the Project. Develop a chain of responsibility for all subcontractors and operators on the Project to ensure that permit provisions are adhered to.
- D. Infiltration areas and constructed infiltration systems should not be constructed until the contributing drainage area and/or adjacent construction has been completely stabilized. When this timing of construction is not possible, insure sediment from exposed soil areas of the Project does not enter into the infiltration area or system.
- E. Stabilization timeframes shall conform to the NPDES General Stormwater Permit for Construction Activity.

- F. Perform weekly and post-rainfall event inspections in accordance with the NPDES permit:
  - 1. Complete and submit the required weekly inspection log.
- G. Prior to Project shutdown for the winter or other periods of a week or more, adequately protect Site from erosion and off Site damage by covering exposed soils with mulch and establishing perimeter controls.
- H. If the Contractor fails to install erosion or sediment measures, the Engineer may withhold payment from related work until the control measures are undertaken by the Contractor:
  - 1. When the Contractor fails to conduct the quality control program, does not conduct the inspection required in the NPDES permit, or fails to take action ordered by the Engineer to remedy erosion or sediment control problems, the Engineer shall issue a Written Order to the Contractor.
  - 2. Respond within 24 hours with sufficient personnel, equipment, materials, and conduct the required Work or be subject to a \$1,000 per calendar day deduction for noncompliance.
- I. Establish permanent turf in accordance with Section 32 92 00 to prevent excessive soil erosion.
- J. Multiple mobilizations will be required for the various erosion and sediment control items.
- K. Silt fence shall be removed prior to project closeout and final acceptance.

## **PART 2 PRODUCTS**

### **2.01 SILT FENCE: Conform to MnDOT Spec. 3886.**

- A. Machine sliced in accordance with City Standard Detail Plate ERO-1A.
- B. Curb Protection: In accordance with City Standard Detail Plate ERO-1B
- C. Super duty: In accordance with City Standard Detail Plate ERO-12A.
- D. Preassembled: Delete MnDOT Spec. 3886.1 – Preassembled.

### **2.02 TEMPORARY CONSTRUCTION ENTRANCE**

- A. Rock Construction Entrance: Conform to City Standard Detail Plate ERO-7:
  - 1. 2 inches minimum clear/washed rock.
  - 2. Underlying Geotextile: Conform to MnDOT Spec. 3733, Type IV.
  - 3. Minimum Thickness of Rock Placed: 6 inches.
- B. Wood Slash Mulch Construction Entrance: Conform to City Standard Detail Plate ERO-7:
  - 1. Raw wood slash only. No chipped-up manufactured wood or chemically treated wood is allowed.
  - 2. Splinter material to an average approximate length of 6 inches with a maximum length of 20 inches. Bark and wood splinters less than 2 inches long shall not exceed 20 percent by mass of the material.
  - 3. Underlying Geotextile: Conform to MnDOT Spec. 3733, Type IV.
  - 4. Minimum Thickness of Mulch Placed: 18 inches.

### **2.03 MULCH: Conform to MnDOT Spec. 3882.**

- A. Type 1, clean grain straw only. Project specific, refer to MnDOT Spec. for options.

- B. Hydraulic erosion control products may be used in lieu of mulch with the approval of the Engineer.

#### 2.04 HYDRAULIC EROSION CONTROL PRODUCTS (HECPs)

- A. Hydraulic Matrix:
  - 1. Mulch: Conform to MnDOT Spec. 3884.2.B.2
  - 2. To be used as part of the Temporary Hydraulic Matrix Bid Item with no seed.

#### 2.05 EROSION CONTROL BLANKET

- A. Conform to MnDOT Spec. 3885:
  - 1. Erosion Control Blanket, Category 3N, straw.

#### 2.06 STORM DRAIN INLET PROTECTION

- A. Inlet protection for paved streets with concrete curb and gutter: The following methods are acceptable:
  - 1. Conform to the details on the Drawings.
  - 2. Catch Basin Inserts:
    - a. Road Drain by Wimco, LLC ([www.roaddrain.com](http://www.roaddrain.com)), in accordance with City Standard Detail Plate ERO-4C.
    - b. Lange Industries ([www.langeindustries.com](http://www.langeindustries.com)), or approved equal.
    - c. Filter bag insert subject to Site and approved by the Engineer.
- B. Inlet protection for non-paved surfaces without curb or areas where vegetation will be established. The following methods are acceptable:
  - 1. Conform to the details on the Drawings.
  - 2. Silt fence box: conform to City Standard Detail Plate ERO-4A and ERO-4D, or approved equal.
  - 3. Sediment control inlet hat:
    - a. InfraSafe Sediment Control Barrier by Royal Enterprises (<http://www.royalenterprises.net/>)
  - 4. Pop-up head
  - 5. Rock filter: conform to City Standard Detail Plate ERO-4B as shown on the Drawings.

#### 2.07 SEDIMENT CONTROL LOGS

- A. Conform to MnDOT Spec. 3897
- B. Straw or wood fiber biorolls, 6 to 7 inches in diameter.
- C. Compost or rock logs, 6 to 8 inches in diameter.

#### 2.08 DITCH CHECKS AND VELOCITY CHECKS

- A. Conform to MnDOT Spec. 2573 and details in Drawings.

#### 2.09 BALE BARRIERS

- A. Type 1 mulch conforming to MnDOT Spec. 2573.3.C.
- B. All bales shall be either bound with wire or tied with nylon string.
- C. Hardwood stakes shall be 1-1/2 inches by 1-1/2 inches by 36 inches.

## 2.10 FLOATATION SILT CURTAIN

- A. Conform to the requirements of MnDOT Spec. 3887.
- B. Curtain depth shall extend to the bottom of the water body.

## 2.11 DUST CONTROL

- A. Water clear and free from suspended fine sediment.

## 2.12 TEMPORARY DOWN DRAIN: Conform to MnDOT Spec. 3892 and detail in Drawings.

## 2.13 TEMPORARY SEED

- A. Conform to Section 32 92 00.

## 2.14 DEWATERING SEDIMENT CAPTURE

- A. General – Sizing, configuration, capacity, and selection of dewatering sediment capture techniques shall be based on Site and flow conditions. Submit the means and methods for review by the Engineer. Sizing of the sediment capture systems will have to be adjusted such that the ultimate discharge water is not visibly different from the receiving water.

## 2.15 FLOCCULANTS: Conform to MnDOT Spec. 3898.

## 2.16 EQUIPMENT

- A. Street sweeper with mechanism for picking up and containing sweepings. Power broom will not be allowed. The Street Sweeper shall have the minimum bristle length as recommended by the manufacture.
- B. Skidsteer (bobcat) to assist in street sweeping.

# **PART 3 EXECUTION**

## 3.01 GENERAL

- A. Comply with all applicable laws, ordinances, regulations, permit requirements, orders and decrees pertaining to erosion/sediment control and stormwater discharge during the conduct of the Work.
- B. Take necessary precautions against damage to the Project by action of the elements.
- C. Implement the Project's NPDES Stormwater Pollution Prevention Plan (SWPPP) and take necessary actions to prevent off Site damage resulting from Work conducted on the Project or Project related stormwater runoff.
- D. Minimize the amount of disturbed land that is susceptible to erosion at any time. Delineate areas not to be disturbed:
  - 1. Exclude vehicles and construction equipment from area not to be disturbed to preserve natural vegetation.
  - 2. Maintain and preserve riparian and naturally vegetated buffer strips (10 feet minimum distance) along water courses.

- E. Restore all disturbed areas that have not had construction activity for more than 14 calendar days with temporary hydraulic matrix. All costs related to furnishing and installing the temporary hydraulic matrix will be considered incidental to the Project, unless a Bid Item has been provided for it and direction has been given by the Engineer.
- F. Street sweeping operations must include the application of water to effectively remove fine materials from pavement areas, as directed by the Engineer. The appropriate amount of water shall be applied to eliminate dust as part of the sweeping operations.

### 3.02 INSTALLATION

- A. General: Install temporary stormwater management and sediment control devices in conformance with the details, typical sections, and elevations shown on the Drawings.
- B. The location of temporary stormwater and sediment control devices may be adjusted from that shown on the Drawings to accommodate actual field conditions and increase the effectiveness of the installation.
- C. Silt Fence: Conform to MnDOT Spec. 2573.3.B:
  - 1. Install in the locations shown on the Drawings using the machine sliced installation method, unless directed otherwise by the Engineer.
  - 2. Use additional measures, such as rock aggregate, placed along the base of the silt fence where the silt fence geotextile cannot be trenched in, i.e. tree roots, frost, bedrock.
  - 3. Use short sections of silt fence placed in J-hook patterns to:
    - a. Supplement the perimeter silt fence at corner locations and areas where sediment deposition will occur. No more than 100 feet of silt fence shall be installed per 1/4 acre of drainage.
    - b. Break up flow path along silt fence running across contours to be no more than 100 feet between hooks or as directed by the Engineer.
  - 4. Silt fence longer than 600 feet shall be constructed in separate independent units with each unit having a length less than 600 feet. Avoid splices whenever possible. If necessary, make splices at an opposing fence post and according to the manufacturer's specifications.
- D. Temporary Construction Entrance:
  - 1. Install at locations shown on the Drawings.
  - 2. Construct construction entrance before grading begins on the Site.
  - 3. Inspect construction entrance daily for mud accumulation to minimize vehicle tracking of sediment onto public roadways. Remove fugitive rock or wood mulch from adjacent roadways daily.
- E. Mulch:
  - 1. For seeded Sites, apply at a rate of 2 tons per acre (4,500 kg/ha).
  - 2. For unseeded Sites, apply at a rate of 2 to 3 tons per acre (4,500 to 6,700 kg/ha), covering the entire soil surface.
  - 3. Distribute mulch evenly by hand or machine and cover the exposed area to a uniform depth.
  - 4. Disk anchor in conformance to MnDOT Sect. 2575.3.D.
  - 5. Anchor mulch immediately to minimize loss by wind or water.
- F. Temporary Hydraulic Matrix:
  - 1. Apply in conformance with Section 32 90 00 and MnDOT Spec. 2575.3.E, but without seed.

- G. Slope (Cat) Tracking:
1. Slope tracking consists of operating a dozer up and down slopes so that the cleats of the tracks create grooves perpendicular to the slope. By operating the dozer up and down, the soil surface is firmed and miniature interceptor checks are created.
  2. Required on all slopes equal to or steeper than 3:1 (H:V).
- H. Erosion Control Blanket:
1. Install immediately following seeding in accordance with MnDOT Spec. 2575.3.G, and as modified below.
  2. Install per Detail Plate ERO-2 as shown on Drawings.
  3. Raking or harrowing of soil/seed shall be done before installation of erosion control blanket.
  4. Install blanket parallel to the direction of flow.
  5. If permanent seeding is not available at the time of blanket installation, this material will have to be removed, re-seeded, and installed again as a permanent erosion control measure. If permanent seeding is available at the time of initial installation, a one-time proper installation is acceptable.
- I. Storm Drain Inlet Protection:
1. Provide effective storm drain inlet protection over the life of the Project until all sources with potential for discharging to inlets have been paved or stabilized.
  2. Place devices so that driving hazards or obstructions are not created. The devices must be cleaned out regularly and all devices must have an emergency overflow to reduce flooding potential.
- J. Temporary Sediment Basins:
1. Sediment basins shall be excavated as a first priority when grading begins on the Project. The location and outlet configuration are shown on the Drawings.
- K. Temporary Sediment Traps:
1. Temporary sediment traps are excavated in conjunction with other grading activities. Temporary traps are approximately 2 feet or less in depth with a length to width ratio of 2:4.
  2. Effectiveness of sediment traps can be increased by placing a rock weeper at the outlet.
- L. Temporary Diversion Berm:
1. Temporary diversion berm shall be installed at locations shown on the Drawings. The berm shall be located to minimize damage by construction operations and traffic.
  2. Temporary diversion berm shall be installed as a first step in the land-disturbing activity and must be functional prior or in conjunction with upslope land disturbance.
  3. The berm shall be adequately compacted to prevent failure.
  4. Temporary or permanent seeding and mulch shall be applied to the berm immediately following its construction.
- M. Temporary Down Drains:
1. When temporary down drains are placed on fill slopes, a temporary earth berm or sandbag barrier shall be constructed as necessary to guide water into the drain.
  2. The inlet of a drain and berm system must be properly constructed to channel water into the temporary drain.
  3. All temporary drains shall be adequately anchored to the slope to prevent disruption by the force of the water flowing into the drain:
    - a. If the drain consists of plastic pipe, it must be securely anchored to the ground.

N. Ditch Checks and Velocity Checks: Reference detail on Drawings.

O. Floatation Silt Curtain:

1. Floatation silt curtain shall be installed in locations shown on the Drawings and according to the manufacturer's specifications:
  - a. "Anchor" and secure to prevent any material from passing beneath, over, around, or through the barrier.
  - b. Provide sufficient slack to permit the curtain to rise to the maximum expected high water level, including wave action, without being overtopped and still be in continuous contact with the bottom.
2. Place floatation silt curtain as close to the shoreline or work area as possible. Flotation silt curtain shall not be placed across flowing rivers, streams, drainage ditches, or across culvert inlets or outlets.

P. Rapid Stabilization:

1. Work to be performed under non-schedulable situations requiring rapid stabilization of small critical areas within 200 feet of surface waters to comply with permit requirements.
2. Methods per MnDOT Spec. 2575.3.M with Seed Mix 100 or 110 replacing Seed Mix 190.

### 3.03 MAINTENANCE

A. Conform to MnDOT Spec. 2573.3.A, NPDES permit, and as follows:

1. Inspect, maintain, and repair any washouts or accumulations of sediment that occur as a result of the grading or construction. Restoration consists of grade repair, turf re-establishment, and street sweeping of mud and debris tracked from the Site.
2. Inspection of all erosion and sediment control items will take place immediately after each runoff event and at least daily during prolonged rainfall. Make any required repairs immediately.
3. Maintain the temporary sediment control devices until they are no longer necessary and are removed:
  - a. Maintenance consists of keeping the devices functioning properly.
  - b. Repair or replace plugged, torn, displaced, damaged, or non-functioning devices.
4. Upon final acceptance of the Project and establishment of permanent erosion control measures, remove all temporary erosion control measures:
  - a. Catch basin protection becomes property of Contractor.
5. Temporary mulching and temporary seeding/mulching are very effective at controlling erosion. However, these are considered temporary measures. These measures may need to be re-established several times throughout the duration of the Work.
6. Floatation silt curtain shall remain in place until such time that water contained within is free from turbidity:
  - a. Remove curtain within 72 hours after this determination has been made.
  - b. At the completion of the Project, remove floatation silt curtain in such a manner so as to minimize release of sediment adhering to the turbidity curtain.

B. Sediment Removal: Conform to MnDOT Spec. 2573.3.P:

1. Remove sediment from erosion control devices when sediment reaches one-third of the height of the devices, restore such features to their original condition.
2. Established areas disturbed by the removal of sediment, will require finish grading and restoration with in-kind materials, such as area disturbed as part of silt fence removal. This work shall be considered incidental to the specific bid item.



- C. Control dust blowing and movement on Site and roads as directed by Engineer to prevent exposure of soil surfaces, to reduce on and off Site damage, to prevent health hazards, and to improve traffic safety.

**END OF SECTION**

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**SECTION 01 70 00**  
**EXECUTION REQUIREMENTS**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes:
  - 1. Requirements for overall execution of the Work and closeout of the Contract for Final Payment.
- B. Measurement and Payment:
  - 1. All Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

1.02 SUBMITTALS

- A. Submit the following items consistent with the Conditions of the Contract and Division 01 Sections:
  - 1. Written Notification of Substantial Completion.
  - 2. Executed Certificate of Substantial Completion.
  - 3. Written Notification of Final Completion.
  - 4. Spare Parts, Operation and Maintenance Manuals, instructions, schedules, warranties, guarantees, Bonds, certificates, certificates of inspection, and other documents.
  - 5. Final Application for Payment, including accompanying documentation.
  - 6. IC-134 Forms.
  - 7. Lien Wavers.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

3.01 EXAMINATION

- A. Acceptance of Conditions: By commencing Work, Contractor construes acceptance of the adjacent work as satisfactory to receive subsequent work.
- B. Existing Conditions: Before commencing Work, inspect work completed by others that is adjacent to Work. If adjacent conditions prevent completion of Work, Contractor will not commence Work until the conditions are corrected.
- C. Inspect each product immediately prior to installation. Remove damaged products from Site.

3.02 GENERAL INSTALLATION REQUIREMENTS

- A. Comply with the manufacturer's instructions for installation of manufactured products to the extent that these instructions are applicable and more explicit or more stringent than requirements indicated in the Contract Documents.

- B. Secure Work true to line and level, within recognized industry tolerances, with anchorage devices designed and sized to withstand stresses, vibration, and rocking. Allow for expansion and movement of building.
- C. Install each element of work during weather conditions and Project status to ensure coordination of the Work. Isolate each element of work from incompatible work as necessary to prevent deterioration.
- D. Record installation details and prepare Record Documents consistent with the General Conditions.

### 3.03 SITE MAINTENANCE

- A. Maintain stockpiles, excavations, access roads, and all other work areas free from dust. Employ dust abatement techniques whenever a dust nuisance or hazard occurs, or as directed by Engineer. Comply with local ordinances.
- B. Protect hazardous work areas and hazardous material storage areas.
- C. Protect trees, unless specifically indicated on Drawings.
- D. Clean access roads and haul routes with mechanical street sweeper.
- E. If Contractor fails to maintain Site, Engineer will provide Written Notice of Contractor's defective Work. Contractor will be given 12 hours from the Notice to clean Site. After the 12-hour period, Owner may correct the defective Work consistent with Article 14.07 of the Conditions of the Contract.

### 3.04 CLEANING AND PROTECTION

- A. Clean and protect Work in progress and adjoining Work during handling and installation. Apply protective covering on installed Work where it is required to ensure freedom from damage or deterioration.
- B. Clean and perform maintenance as frequently as necessary throughout construction period. Adjust and lubricate operable components to ensure operability without damage effects.

### 3.05 CUTTING AND PATCHING

- A. Complete all cutting, fitting, and patching as necessary to join the new Work to existing conditions.
- B. Remove or cut existing work only as necessary to join the new work to the existing construction or as required by the Contract Documents.
- C. Patch defective and incomplete surfaces caused or exposed by Work of the Project.
- D. Repair any damage to existing conditions and patch to match.
- E. Existing construction designated by the Contract Documents to remain that is loosened, cracked, or otherwise damaged or defaced beyond repair as a result of Work by the Contractor will be considered unsuitable for the use intended and shall be removed and replaced by the Contractor.

3.06 CERTIFICATE OF COMPLIANCE WITH MINNESOTA STATUTES 290.92 AND 290.97

- A. Upon completion of the Project and prior to Final Payment, the Contractor and all subcontractors shall complete Minnesota Department of Revenue Revised Form IC-134. This form, Affidavit for Obtaining Final Settlement of Contract with the State of Minnesota and any of its Political or Governmental Subdivisions, is to be signed by a Department of Revenue representative and forwarded to the Owner. Copies of this form can be obtained by writing to the Minnesota Department of Revenue, Forms Section, Mail Station 1173, St. Paul, MN 55146-1173 or by calling (651) 296-4444.

**END OF SECTION**

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## **SECTION 02 41 13**

### **SELECTIVE SITE DEMOLITION**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Complete or partial removal and disposal or salvage of at grade, above grade, and below grade structures and miscellaneous items.
- B. Related Sections:
  - 1. Section 31 23 00 - Excavation and Fill.
  - 2. Section 32 13 14 - Concrete Walks, Medians, and Driveways.
  - 3. Section 32 16 13 - Concrete Curb and Gutters.
  - 4. Section 32 17 23 - Pavement Markings.
  - 5. Section 33 05 05 - Trenching and Backfilling.
  - 6. Section 33 10 00 - Water Utilities.
  - 7. Section 34 41 05 - Traffic Signs and Devices.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Payment at the Bid Unit Price will be considered compensation in full for all Work necessary to complete the Bid Item in full, including removal, salvage, storage, disposal, and reinstallation.
  - 2. Measurement will be based upon the units as listed below for items removed, abandoned, or salvaged complete as specified. No measurement will be made of any removals that are not required. The actual quantity removed multiplied by the appropriate Bid Unit Price will be compensation in full for all Work and costs of the following Bid Items:
    - a. Sawing Concrete Pavement and Sawing Concrete Driveway Pavement: Per lineal foot along the saw cut line as staked, regardless of thickness.
    - b. Sawing Bituminous Pavement (Street or Trail) and Sawing Bituminous Driveway Pavement: Per lineal foot along the saw cut line as staked, regardless of thickness.
    - c. Remove Bituminous Street Pavement: Per square yard without regard to thickness, including integral bituminous curb if applicable.
    - d. Remove Bituminous Trail and Remove Bituminous Driveway Pavement: Per square yard without regard to thickness.
    - e. Remove Bituminous Wedge: Per square yard of bituminous wedge removed, regardless of thickness.
    - f. Mill Bituminous Pavement: Per square yard, according to depth, including off-site disposal.
    - g. Bituminous Joint Milling: Per linear foot of joint.
    - h. Remove Concrete Pavement: Per square yard without regard to thickness.
    - i. Remove Concrete Sidewalk: Per square foot without regard to thickness.
    - j. Remove Concrete Pedestrian Ramp: Per square foot without regard to thickness.
    - k. Remove Concrete Valley Gutter: Per square yard without regard to thickness.
    - l. Remove Concrete Curb and Gutter: Per linear foot, regardless of type.
    - m. Remove Concrete Driveway Pavement: Per square yard without regard to thickness.
    - n. Remove Concrete Spillway: Per square yard without regard to thickness.
    - o. Remove Concrete Median: Per square yard, without regard to thickness.
    - p. Remove Hydrant: Per each.

- q. Remove Catch Basin or Manhole: Per each, regardless of size of structure. Granular material is incidental to the removal.
- r. Remove Retaining Wall: Per square yard, measured to existing ground level.
- s. Remove Pipe or Culvert: Per linear foot of the size and type specified, measured from center of junction fittings, catch basins, or manholes, and will include the length of any aprons or fittings.
- t. Remove Trash Guard from Flared End Section: Per each, according to size and type.
- u. Remove Sign Post or Barricade: Per each.
- v. Remove Pavement Markings: Per linear foot, regardless of type or size.
- w. Remove Pavement Messages: Per each, regardless of type or size.
- x. Abandon Pipe: Per linear foot according to size of pipe, measured from center of junction fittings, catch basins, or manholes, and will include bulk heading and filling the pipe with lean mix backfill.
- y. Abandon Structure: Per each, regardless of size of structure, and will include furnishing and installing granular material and removal of casting, adjusting rings and top section from Site.
- z. Salvage and Reinstall Fence: Per linear foot of the type specified.
- aa. Salvage and Reinstall Pipe or Culvert: Per linear foot of the type and size specified.
- bb. Salvage and Reinstall Flared End Section: Per each of the size specified.
- cc. Salvage and Reinstall Sign: Per each, including post(s).
- dd. Salvage and Reinstall Mailbox: Per each. Payment will include all costs to salvage and re-install the mailbox, including similar footing.
- ee. Salvage and Reinstall Valve and Box: Per each, according to size & type.
- ff. Salvage and Reinstall Permanent Barricade: Per each, including sign panel.
- gg. Salvage and Reinstall Hydrant: Per each.
- hh. Temporary Mailbox: Per each. Payment will include all costs to furnish and install a temporary mailbox at a temporary location as determined by the Engineer in the field.
- 3. Homeowners will be responsible for removing irrigation, landscaping, fences, etc. within the right-of-way that are in conflict with the proposed construction of the final street improvements.
- 4. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. Minnesota Department of Transportation "Standard Specifications for Construction" 2018 Edition (MnDOT Spec.):
  - 1. 2104 – Removing Pavement and Miscellaneous Structures.

### 1.04 DEFINITIONS

- A. Remove: To take away or eliminate from the Site by any method selected by the Contractor, including disposal of material.
- B. Salvage: To dismantle, disassemble, or remove carefully without damage so the item can be re-assembled, replaced, or reused in a workable condition equal to that existing before removal.
- C. Abandon: To fill, bulkhead, or close off pipes and structures so that no settlement or flow can occur.



## 1.05 REGULATORY REQUIREMENTS

- A. Conform to MnDOT Spec. 2104.3.C, with the following modifications:
  - 1. Dispose of all materials designated for removal outside the Site at locations selected by Contractor.
  - 2. Stockpile or temporarily store materials designated for salvage at locations provided by Contractor.

## 1.06 SCHEDULING

- A. Prior to starting Work, submit for review by the Engineer and approval by the Owner, a schedule showing the commencement, order, and completion dates of the various parts of this Work.
- B. Install temporary erosion control, construction fence, barriers, and warning signs prior to removals.
- C. Fill holes or depressions resulting from removal or salvage immediately.
- D. Complete the remove and replace concrete curb or sidewalk to allow access to driveway within 7 calendar days, beginning on the day of the removals, or per applicable Milestones in Section 00 52 10 – Agreement, Paragraph 4.02.A.1.
- E. Provide temporary surface restoration for traffic continuity where removal or salvage operations are completed within streets, driveways, or parking lots.

## **PART 2 PRODUCTS**

### 2.01 LEAN MIX BACKFILL: Conform to MnDOT Spec. 2520

## **PART 3 EXECUTION**

### 3.01 GENERAL

- A. Dispose of all items removed, except for those items identified to be salvaged or recycled. Said disposal shall be in accordance with all laws, regulations, statutes, etc.
- B. Perform removal work without damage to adjacent retained work. Where such Work is damaged, patch, repair, or otherwise restore same to its original condition at no expense to the Owner.
- C. Remove debris from the work area as often as necessary, but not less than at least once at the end of each workday. Debris shall be placed in approved containers to prevent the spread of dust and dirt.
- D. Execute the Work in a careful and orderly manner with the least possible disturbance to the public and occupants of buildings.
- E. Fill holes resulting from removals consistent with Section 31 23 00.
- F. Remove and replace damaged curb as directed by the Engineer.
- G. Remove 10 feet of concrete curb and gutter on each side of the catch basin that are adjusted, as directed by the Engineer.

### 3.02 EXAMINATION

- A. Meet with owners of signs to determine requirements for salvage, storage, and replacement.
- B. Develop plan acceptable to Engineer and postal service for maintaining mail service. Temporary relocations of mailboxes will be necessary.

### 3.03 PROTECTION

- A. Take all necessary precautions to adequately protect personnel and public and private property in the areas of Work. All Site fencing shall be in place prior to the start of any removal work.
- B. Remove, store safely, and replace all street signs, traffic control signs, guy wires, mailboxes, posts, wood fence, etc. that may interfere with construction.
- C. Provide approved barriers or warning signs as necessary.
- D. Provide and maintain temporary protection of existing structures designated to remain where removal work is being done, connections made, materials handled, or equipment moved.
- E. Do not close or obstruct walkways or roadways. Do not store or place materials in passageways or other means of egress. Conduct operations with minimum traffic interference.
- F. Take reasonable precautions to limit damage to existing turf.
- G. Holes or depressions created by removals shall not be left open for more than 1 day. Any hole within 10 feet of sidewalks shall be filled, suitably marked, or covered immediately.
- H. Avoid disturbance to any material beyond the limits required for new construction.

### 3.04 SAWING PAVEMENT

- A. Concrete Pavement: Saw along the removal line to full depth of the existing concrete prior to removal of the pavement.
- B. Bituminous Pavement: Saw along the removal line to the full depth of the pavement prior to removal of the pavement.
- C. Provide means and method (such as snapping a chalk line) to establish a straight and uniform sawed line.

### 3.05 REMOVE CONCRETE PAVEMENT

- A. Remove in accordance with MnDOT Spec. 2104.3.C, except as modified below:
  - 1. Saw cut concrete pavement and concrete base prior to mechanical pavement removal equipment. Remove concrete in such a manner that the remaining pavement is not damaged.
  - 2. Prior to restoring trench areas, the edges of the trench shall be trimmed back to a vertical face on a straight line which is parallel with the centerline of the trench.

### 3.06 REMOVE BITUMINOUS PAVEMENT

- A. Remove in accordance with MnDOT Spec. 2104.3.C, except as modified below:
  - 1. Saw cut bituminous pavement at the removal limits prior to that removal, unless otherwise approved by the Engineer.

### 3.07 REMOVE CURB AND GUTTER

- A. Saw cut at removal limits.
- B. Concrete Curb and Gutter and Bituminous Curb: Conform to the City Standard Detail Plates and the City requirements as outlined in the "New Street and Sidewalk Construction Policy."
- C. Limits of removal may vary in length (5 feet minimum) and may be in multiple locations.

### 3.08 PAVEMENT MILLING

- A. Bituminous:
  - 1. Saw cut at removal limits prior to milling process.
  - 2. Mill bituminous surface to the depth specified as shown on the Drawings or as directed by the Engineer. The milled surface shall be uniform and consistent, with minimal depth of grooves.
  - 3. Dispose of millings at an approved off-site disposal location.
  - 4. Sweeping with pickup broom or vacuum clean the milled surface shall be incidental to the milling process. Perform sweeping until milled surface is accepted by the Engineer.
- B. Concrete:
  - 1. Mill surface to the depth specified as shown on the Drawings or as directed by the Engineer.
  - 2. Dispose of millings at an approved off-site disposal location.
  - 3. Sweeping with pickup broom and cleaning the milled surface shall be incidental to the milling process.

### 3.09 BITUMINOUS JOINT MILLING:

- A. Mill to the depth and width as shown on the detail drawing, at the location marked by the Engineer in the field.

### 3.10 REMOVE CONCRETE SURFACING

- A. Work includes sidewalks, pedestrian ramps, medians, valley gutters, and driveways.
- B. Saw cut concrete surfacing prior to removal.
- C. Remove concrete in such a manner that the remaining surfacing is not damaged.
- D. When removing existing sidewalks, do not disturb any material beyond the limits required for new construction (assumed as 6 inches maximum beyond and 8 inches maximum below existing grade).
- E. When removing existing driveways, do not disturb any material beyond the limits required to form for new construction (assumed 12 inches maximum from the back of new Work and 6 inches beyond the edge of new driveways).

- F. Prior to restoring trench areas, the edges of the trench shall be trimmed back to a vertical face on a straight line which is parallel with the centerline of the trench.

### 3.11 REMOVE BITUMINOUS TRAILS AND DRIVEWAYS

- A. Saw cut bituminous surfacing to full depth at the limits of partial removal prior to that removal, unless otherwise approved by the Engineer.
- B. Remove bituminous in such a manner that the remaining surfacing is not damaged.
- C. Prior to restoring trench areas, the edges of the trench shall be trimmed back to a vertical face on a straight line which is parallel with the centerline of the trench.
- D. When removing existing trails and driveways, do not disturb any material beyond the limits required to form for new construction (assumed 12 inches maximum from the back of new work and 6 inches beyond the edge of new driveways).

### 3.12 REMOVE BITUMINOUS WEDGE

- A. Remove bituminous wedge as shown on the Drawings or as directed by the Engineer.
- B. Mill bituminous wedge in a manner that does not disturb the bituminous non wear course.

### 3.13 REMOVE/ABANDON MANHOLES AND CATCHBASINS

- A. Remove Structure:
  - 1. Remove entire structure, including casting and adjusting rings.
  - 2. Fill void left by structure with suitable material per Section 33 05 05.
- B. Abandon Structure:
  - 1. Remove casting, adjusting rings, and cone section or manhole section of structure, a minimum of 3 feet below final grade.
  - 2. Place and compact granular material within the remaining in place structure and the excavated area to finish grade.

### 3.14 REMOVE/ABANDON SECTIONS OF EXISTING PIPE

- A. Remove Pipe:
  - 1. Remove entire pipe to limits shown on the Drawings or as directed by the Engineer.
  - 2. Fill void left by pipe with suitable material per Section 33 05 05.
- B. Abandon Pipe:
  - 1. Bulkhead pipe with an 8-inch thick, non-shrink concrete grout plug at the upstream and downstream ends, and at locations as determined by the Engineer. On pipes 18-inches diameter and larger, brick or concrete block masonry may be used with non-shrink grout to construct the bulkhead.
  - 2. Fill with lean mix backfill.
- C. Remove pipe to be abandoned if the top of pipe is within 3 feet of final surface elevation.

### 3.15 REMOVE RETAINING WALL

- A. Avoid damage to sections of wall to remain.

- B. Dispose of materials off the Site at a predetermined location.
- C. Remove wall in its entirety, including footings and tiebacks.

### 3.16 REMOVE SIGNS AND BARRICADES

- A. Remove signs and barricades as shown on the Drawings or as directed by the Engineer.
- B. Owner to salvage sign panel from post prior to removal of post.
- C. Remove remaining post following salvaging of sign panel by Owner.
- D. Remove barricade, including "future road extension" sign.
- E. Provide Engineer or Owner 48 hours notice prior to removing posts or barricades.

### 3.17 REMOVE PAVEMENT MARKINGS AND MESSAGES

- A. Remove to the limits shown on the Drawings or as directed by the Engineer.
- B. Removal of markings and messages shall be accomplished with suitable sand or water blasting equipment, unless other means are authorized by the Engineer. Grinding is not an acceptable method of removal. The bituminous street surface shall not be damaged by the removal operations.

### 3.18 SALVAGE AND REINSTALL

- A. Signs and Barricades:
  - 1. In no case shall a traffic sign or street sign be removed or disturbed by Contractor without prior notification being given to Engineer and then only after satisfactory arrangements have been made for a temporary installation or its disposition:
    - a. Maintain temporary post mounted street identification signage at all times due to its importance to the 911 Emergency Response System.
    - b. Maintain temporary post mounted traffic signage on all streets open to traffic.
    - c. Temporary post mounted installation shall be considered incidental to the Project.
  - 2. Owner to salvage sign panel from post and temporarily store until reinstallation.
  - 3. Remove remaining post following salvaging of sign panel by Owner.
  - 4. Install temporary post mounted signs as described above.
  - 5. Install new post and hardware per Section 34 41 05.
  - 6. Attach salvaged sign panel provided by Owner.
  - 7. Remove signs and barricades that are damaged during construction and replace with new signs as incidental to the Project.
  - 8. Contact the County directly related to all signs within the County right-of-way that may need to be temporarily or permanently removed.
- B. Mailboxes:
  - 1. Remove and salvage existing mailboxes that interfere with the Work or whose access is restricted by the construction activities.
  - 2. Place at temporary locations as directed by Engineer or as shown on Drawings.
  - 3. Removal, temporary re-installation, and replacement shall occur such that mail delivery is not interrupted.
  - 4. Reinstall in locations as shown on Drawings or as directed by Engineer.

5. Replace mailboxes, posts, and appurtenances damaged during construction at no charge to Owner.

C. Fences:

1. Salvage and store fence and post material where they are in conflict with the Work.
2. After completion of Work, reinstall fence to the condition existing prior to removal.
3. Install temporary snow fence or similar barrier at the end of the working day while the permanent fence is removed.

D. Pipes, Culverts and Flared End Sections:

1. Where possible, salvage existing pipe in areas to be disturbed by the construction.
2. Reinstall in original condition and location as shown on the Drawings.
3. If requested by the Owner, deliver salvaged material to Owner's Maintenance Facility.

E. Hydrants, Valves, and Hydrant Lead:

1. Salvage existing hydrants, valves and boxes, and ductile iron pipe leads at locations shown on the Drawings or as determined by the Engineer.
2. Reinstall in original condition at the location shown on the Drawings or as directed by the Engineer.
3. Reinstall per Section 33 10 00 and the standard details shown on the Drawings.

### 3.19 REMOVE AND REPLACE

A. Concrete Sidewalk and Concrete Curb and Gutter:

1. It is anticipated that sections of concrete sidewalk and curb and gutter may be damaged from utility, building, other activity during the period between placement of the bituminous base or interim bituminous base and wear courses, or identified by the Engineer as part of a street rehabilitation type project.
2. Prior to placement of the bituminous wear course surfacing, remove and replace damaged sections of concrete sidewalk and curb and gutter as directed by the Engineer.
3. Sawcut at removal limits.
4. Do not disturb any material beyond the limits required to form for new construction (assumed 12 inches maximum from the back and 6 inches beyond the edge of new work).
5. Install new sidewalk as per Section 32 13 14.
6. Install new curb and gutter per Section 32 16 13.

### 3.20 FIELD QUALITY CONTROL

- A. Salvaged items to be reinstalled shall be of the same shape, dimension, location, and quality of the original item prior to construction.
- B. Items damaged during removal or salvaging operations shall be replaced with new material of equal type and quality of the damaged item when it was new.

### 3.21 DISPOSING OF MATERIAL

- A. Dispose of all materials outside of the Site at disposal location selected by Contractor in compliance with state and local regulations. Burying of material and debris is not allowed within the Site.

## END OF SECTION

## **SECTION 31 10 00**

### **SITE CLEARING**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

**A. Section Includes:**

1. Removal and trimming of vegetation and trees and stripping and stockpiling of sod and topsoil.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

**A. Measure and Payment:**

1. Payment at the Unit Price will be considered compensation in full for all work necessary to complete the Bid Item in full.
2. Clearing and Grubbing:
  - a. Measurement will be by physical count of each tree cleared and grubbed having a diameter of more than 4 inches at a point 24 inches above the ground surface. Payment will constitute compensation in full for all removal, disposal work, and costs.
  - b. Measurement will be by lump sum for all Project Clearing and Grubbing. Payment will constitute compensation in full for all removal, disposal work, and costs.
  - c. Measurement will be by acre of trees cleared and grubbed. Measurements shall be made horizontally to points 10 feet outside the trunks of trees or stumps on the perimeter of the area being measured. Any separate area smaller than 1/20 acre will be considered to be 1/20 acre:
    - 1) Whenever isolated trees or stumps are removed outside the areas designated to be cleared and grubbed, the acre payment will be made by:
      - a) Each tree measuring more than 4 inches, but less than 36 inches in diameter, at a point 2 feet above the ground surface, and each stump measuring more than 4 inches, but less than 36 inches, at the point of cutoff will be considered as being 1/20 acre.
      - b) Each tree or stump measuring 36 inches or more in diameter will be considered as being 1/10 acre.
  - d. Payment will constitute compensation in full for all removal, disposal, and costs.
3. Clearing:
  - a. Measurement will be by physical count of each tree cleared having a diameter of more than 4 inches at a point 24 inches above the ground surface. Payment will constitute compensation in full for all removal, disposal, and costs.
  - b. Measurement will be by acre of trees cleared. Measurements shall be made horizontally to points 10 feet outside the trunks of trees or stumps on the perimeter of the area being measured. Any separate area smaller than 1/20 acre will be considered to be 1/20 acre.
4. Grubbing:
  - a. Measurement will be by physical count of each tree or stump grubbed. Payment will constitute compensation in full for all removal, disposal, and costs.
  - b. Measurement will be by acre of trees or stumps grubbed. Measurements shall be made horizontally to points 10 feet outside the trunks of trees or stumps on the perimeter of the area being measured. Any separate area smaller than 1/20 acre will be considered to be 1/20 acre.
5. Sod Removal: This Work is considered incidental to the other Work of the Contract.

6. Windfall/Deadfall Removal: This Work shall be incidental to the Project with no direct compensation.
7. Brush Removal: This Work shall be incidental to the Project.
8. Stripping and Stockpiling of Soil: This Work shall be considered incidental to other Work in the Contract.
9. Any tree trimming necessary to perform other work in the Contract shall be considered incidental.
10. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.):
  1. 2101 – Clearing and Grubbing.
  2. 2571 – Plant Installation and Establishment.

### 1.04 DEFINITIONS

- A. Brush: All bushes, shrubs, and other vegetation that can be cut with a brush scythe or mowing machine, including small isolated trees having a diameter of 4 inches or less at a point 2 feet above the ground surface.
- B. Clearing: Cutting, removing, and disposing of trees, shrubs, bushes, windfalls, and other vegetation in the designated areas.
- C. Grubbing: Removing and disposing of stumps, roots, and other remains in the designated areas.
- D. Tree Trimming/Pruning: Cutting broken, damaged, or obstructing branches and installing wound dressing. Includes the uplift of branches along the roadway to allow for street construction.

### 1.05 SITE CONDITIONS

- A. Work consists of removing trees generally along the easement lot lines designated for utilities.
- B. The Drawings do not specifically show all trees to be removed or transplanted.
- C. Protect specimen trees close to Work that are designated to remain but may be damaged by Work.

### 1.06 SEQUENCING AND SCHEDULING

- A. Install temporary erosion control measures prior to Work of this Section.
- B. Complete before or sufficiently ahead of on-going rough grading, excavation, backfill, and compacting for utilities.

## **PART 2 PRODUCTS**

### 2.01 WOUND DRESSING

- A. Asphalt base tree paint.
- B. Other acceptable materials per Engineer's approval.



## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Review removals in the field with the Engineer prior to doing Work. Clearing limits will be clearly marked by the Engineer.
- B. Assume multiple mobilizations for the Work of this Section.
- C. Stockpile soil to eliminate contamination with other on Site materials.

### **3.02 CLEARING AND GRUBBING**

- A. Clearing Trees: Cut off, remove, and dispose of trees and brush in the areas designated as a clearing operation. When grubbing is not required, the point of cut off shall be 6 inches above the ground.
- B. Clearing Brush: Cut even with the ground surface.
- C. Grubbing: Remove brush, stumps, roots, and other remains to a minimum depth of 6 inches below subgrade for all proposed sections.
- D. Backfill all depressions resulting from the grubbing operations in accordance with Section 31 23 00.

### **3.03 TRIMMING AND PRUNING**

- A. As directed by the Engineer, trim trees that are to be saved but interfere with the proposed construction. Paint all cuts with wound dressing.

### **3.04 STRIPPING**

- A. After clearing and grubbing have been completed, strip sod and topsoil to a line 2 feet outside of areas to be occupied by structures, walks, roadways, areas to be excavated or filled, and other areas shown.
- B. As directed by Engineer, Stockpile sufficient topsoil to re-spread at a uniform depth of 4 inches to all disturbed areas identified for seeding or sodding:
  - 1. Do not strip within the drip line (branch spread) of trees identified to remain.

### **3.05 DISPOSAL LIMITATIONS**

- A. Conform to MnDOT Spec. 2101.3.D, or as modified herein:
- B. Dispose of all cleared and grubbed material and debris outside the right-of-way at a location selected by the Contractor, except for trees and logs identified to be salvaged.
- C. Disposal site should be a properly designated landfill area as determined by appropriate governmental agencies or lands under direct control of the Contractor.
- D. Stripped materials not used for embankments shall be disposed off the Site.
- E. On Site burial of any debris is not permitted.

F. On site burning of debris is not permitted.

### 3.06 PROTECTION

- A. Conduct operations so as not to damage surrounding private property.
- B. Protect trees intended to be saved from injury or defacement during operations:
  - 1. Restrict widths of utility trenches.
  - 2. Provide protective bracing, sheeting, or box to insure safe Work conditions as incidental to Contract.
- C. Exercise care to keep salvaged material as clean as possible during operations.
- D. Install temporary fencing at the construction limits and drip lines of trees to be protected prior to any construction activities in order to protect vegetation.

### **END OF SECTION**

## **SECTION 31 23 00**

### **EXCAVATION AND FILL**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Excavation and fill for roadways, foundations, channels, ponds, and other areas.
- B. Related Sections:
  - 1. Section 01 57 13 - Temporary Erosion and Sediment Control.
  - 2. Section 02 41 13 - Selective Site Demolition.
  - 3. Section 31 10 00 - Site Clearing.
  - 4. Section 31 23 13 - Subgrade Preparation.
  - 5. Section 33 05 05 - Trenching and Backfilling.
  - 6. Section 32 92 00 - Turf Establishment.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Measurement and payment shall be at the Bid Unit Price consistent with MnDOT Spec. 2106.4 and 5, except as modified in the following.
  - 2. Common Excavation (EV): Measurement will be by volume of material in its original position, based on pre-construction cross sections and the design grading grade profile performed by the Engineer. Quantity shall be calculated and computed by the average end area method, using the original cross sections. Payment will include placing and compacting suitable material on Site and disposal of excess material off the Site.
  - 3. Common Excavation (EV): Trail or Sidewalk: Measurement will be by volume of material in its original position, based measurements performed by the Engineer at the time of construction. Payment will include all costs related to placing and compacting suitable material onsite and disposal of excess off site.
  - 4. Subgrade Excavation (EV): Measurement will be by volume of material in its original position, based on pre-construction and post-construction cross sections taken by the Engineer. Quantity shall be calculated by the average end area method. Payment will include excavation and disposal of excess material off the Site.
  - 5. Subgrade Excavation (EV): Trail or Sidewalk: Measurement will be by volume of material in its original position, based on pre-construction and post-construction cross sections taken by the Engineer. Quantity shall be calculated by the average end area method. Payment will include excavation and disposal of excess material off the Site.
  - 6. Common Embankment (CV): Measurement will be by volume of material compacted in place based on pre-construction cross sections and the design grade. Payment will include all costs related to testing, delivery, placement, compaction, and final finishing.
  - 7. Aggregate Backfill: Measurement will be by the ton of material compacted in place as determined from weight tickets delivered to the Engineer. Payment will include all costs related to furnishing and installing the material complete in place as specified:
    - a. If the aggregate backfill material is being wasted or placed excessively thick, the Owner reserves the right to deduct quantities that are in excess of plan thickness. Said quantities shall be based on material weighing 110 pounds per square yard of area per inch of thickness.

8. Aggregate Backfill – Trail or Sidewalk: Measurement will be by the ton of material compacted in place as determined from weight tickets delivered to the Engineer. Payment will include all costs related to furnishing and installing the material complete in place as specified:
  - a. If the aggregate backfill material is being wasted or placed excessively thick, the Owner reserves the right to deduct quantities that are in excess of plan thickness. Said quantities shall be based on material weighing 110 pounds per square yard of area per inch of thickness.
9. Boulevard Grading: Payment for this final Boulevard Grading, including placing, grading, and compacting topsoil, shall be made under the Bid Item included in the Bid Form based upon the number of hours actually spent grading:
  - a. Initial backfilling of the curb is considered incidental to the installation of the curb.
  - b. Payment for furnishing of topsoil will be made under the Topsoil Borrow Bid Item, per Section 32 92 00.
10. Boulevard Stripping: Measurement will be per hour of time actually spent stripping, hauling, and disposing of boulevard sod. Payment will include all costs related for performing the work as specified.
11. Haul Excess Reclaimed Material Offsite (LV): Measurement will be by the loose volume of material hauled offsite by means of a truck count. Payment will include all costs related to removing and disposing of material off the Site.
12. Payment for Placing Topsoil Borrow has been made in Section 32 92 00 – Turf and Grasses.
13. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

#### 1.03 REFERENCES

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.):
  1. 2106 - Excavation and Embankment – Compacted Volume Method
  2. 3149 - Granular Material.
  3. 3877 - Topsoil Material.

#### 1.04 SUBMITTALS

- A. Submit the following items consistent with Section 01 33 00:
  1. Gradation tests for borrow materials.

#### 1.05 DEFINITIONS

- A. The definitions of the different classifications of excavation and borrow material shall conform to MnDOT Spec. 2106.1 and 2, or as modified herein:
  1. Common Excavation: In locations where the design cross section is in a cut section, common excavation shall be classified as all excavation above the grading grade that has not been classified as another form of excavation in this Section. In areas where the design cross section is in a fill section, common excavation shall consist of excavation of topsoil. Common Excavation shall not include payment for pavement removal when a separate bid item is present.
  2. Subgrade Excavation: Excavation below the grading grade that has not been classified as another form of excavation in this Section.
  3. Topsoil borrow material shall conform to Section 32 92 00 – Turf and Grasses.

## 1.06 QUALITY ASSURANCE

- A. Assist testing laboratory by excavating for density tests. Assist testing laboratory with obtaining material samples.

## 1.07 SEQUENCING AND SCHEDULING

- A. Perform excavation as soon as possible after sewer and water construction.
- B. Complete subgrade for streets, driveways, walks, and parking lots immediately after trench backfill and compaction.
- C. Provide notice by 3:00 pm of any aggregate backfill placement for the following day, to allow time for scheduling subgrade inspection and compaction tests prior to any aggregate backfill being placed.
- D. Aggregate backfill placement shall not occur until the Boulevard has been graded to within 6" of finished grade per typical section.
- E. Complete finish grading of turf areas within 5 calendar days after backfill.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Common Borrow: Conform to MnDOT Spec. 2106.2.B:
  - 1. Soil which is capable of attaining specified compaction levels, excluding soils which contain organics, contain debris or are potentially expansive (CH or MH per the Unified Soil Classification System).
- B. Granular Borrow: Conform to MnDOT Spec. 3149.2.B.1.
- C. Select Granular Borrow: Conform to MnDOT Spec. 3149.2.B.2.
- D. Aggregate Backfill:
  - 1. Only virgin materials allowed.
  - 2. Conform to the following gradation requirements or a deduct will be required per price adjustment tables found on the Grading and Base website:

Sieve Size	Percent Passing
3 Inch	100
2 Inch	80 to 100
#40	0 to 50
#200	0 to 12

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Conform to MnDOT Spec. 2106.3.A, or modified herein:
  - 1. Establish traffic control prior to excavations.
  - 2. Establish the specified erosion control devices according to Section 01 57 13 prior to all excavations.
  - 3. Notify utility companies of progress schedule so they can accomplish relocations, removals, and holding of lines.
  - 4. Perform removals consistent with Section 02 41 13.
  - 5. Strip topsoil consistent with Section 31 10 00.
  - 6. No borrow areas are allowed within City right-of-way.

### **3.02 PREPARATION OF EMBANKMENT**

- A. Conform to MnDOT Spec. 2106.3.C, or as modified herein:
  - 1. Engineer's approval is required of all areas where preparation works has been performed prior to the placement of the embankment or fill material.
  - 2. Where embankment is to be constructed over swamp, marsh, or other locations where the foundation material is unstable, the foundation shall be excavated to remove all or part of the unstable material.

### **3.03 EXCAVATION OPERATIONS**

- A. Conform to MnDOT Spec. 2106.3.D, or as modified herein:
  - 1. Perform excavations to the alignment, cross section, and grade as shown on the Drawings and staked by the Engineer.
  - 2. Excavation of unstable material below grade shall be done under the direction of the Engineer as the subsurface conditions are disclosed.
  - 3. Remove muck excavation material so as to minimize disruption to the bottom of the excavation.
  - 4. Notify Engineer immediately of any large boulders or ledge rocks encountered so proper measurement or profile can be made for pay quantities.
  - 5. No solid rock will be allowed within 12 inches of the subgrade.
  - 6. Provide and maintain temporary drainage facilities until permanent facilities are completed.
  - 7. After the roadway excavation is complete and prior to backfilling operations, notify the Engineer 24 hours in advance so all excavation areas can be cross-sectioned to determine quantities.
  - 8. Cut, fill, and grade Site to elevations and contours shown on the Drawings with allowances for pavements, topsoil, and structures.
  - 9. Mining of material in boulevards for use in street construction will not be allowed.
  - 10. Excess reclaimed material above and beyond that needed for the aggregate base shall be properly disposed of at a location off of the Site:
    - a. The resulting reclaimed material could contain diesel range organics (DRO) which must be disposed of in accordance with MPCA requirements.
- B. On street rehabilitation projects, excavation and disposal of the existing boulevard material to allow for the placement of the new concrete curb and gutter, and specified depth of topsoil/compost shall be considered incidental to the concrete curb removal Bid Item.

### 3.04 DISPOSITION OF EXCAVATED MATERIAL

- A. Conform to MnDOT Spec. 2106.3.I, or as modified herein:
  - 1. No disposition of bituminous millings will be permitted, unless thoroughly mixed with other on Site materials.
  - 2. If a reclamation process is used to remove pavement, the resulting reclaimed material could contain diesel range organics (DRO) which must be disposed of in accordance with MPCA requirements.

### 3.05 PLACING EMBANKMENTS

- A. Conform to MnDOT Spec. 2106.3.E:
  - 1. Topsoil placement shall conform to Section 32 92 00.

### 3.06 COMPACTING EMBANKMENTS

- A. Conform to MnDOT Spec. 2106.3.F, or as modified herein:
  - 1. Compaction required for embankment materials shall conform to the Specified Density Method (nuclear) with the testing location and rates being determined by the Engineer.
  - 2. Backfilling of embankments shall be performed using on Site materials: If the Contractor is unable to meet the specified density requirements using that material due to excess moisture content, they shall immediately notify the Engineer of this condition.
  - 3. Recognize that inclement weather (sometimes heavy) occurs during the construction season and be responsible for protecting the moisture condition of soils during the construction phase. Such protection measures include sloping of exposed surfaces to promote runoff (avoid ponding) and compacting exposed surfaces prior to rain events to minimize infiltration.
  - 4. Compaction required for aggregate backfill materials shall conform to the Specified Density Method (nuclear) with the testing location and rates being determined by the Engineer.

### 3.07 FINISH OPERATIONS

- A. Conform to MnDOT Spec. 2106.3.H, or as modified herein:
  - 1. Finish grading of granular borrow, select granular borrow, and aggregate backfill prior to placement of an aggregate base shall conform to MnDOT Spec. 2112.3.E.
  - 2. Grading of the soils beneath the proposed topsoil shall be reviewed and approved by the Engineer prior to the start of the topsoil placement.

### 3.08 BOULEVARD GRADING

- A. Backfill Curb After It Has Hardened:
  - 1. Leave the boulevards within a tolerance of 0.3 feet plus or minus of finish grade prior to installation of private underground utilities.
  - 2. Compact the backfill material directly behind the concrete curb to meet the requirements of "Quality Control Compaction."
- B. Following installation of private underground utilities by others, re-grade entire boulevard area to the right-of-way, including the re-spreading of topsoil stockpiles located adjacent to the boulevard areas:
  - 1. It is intended that this work be done with 1 small dozer.
  - 2. The extent of the final work and the hours of work shall be reviewed with the Engineer prior to any grading being done.
  - 3. Compaction is required as part of the backfill procedure.

- C. Reconstruction and Final Street Improvement Projects:
  - 1. Grade, shape, and prepare boulevards disturbed by construction for topsoil and sod placement.
  - 2. Place, grade, and compact topsoil, minimum 4 inches thick.

### 3.09 BOULEVARD STRIPPING

- A. Final Street Improvement Projects:
  - 1. Strip sod adjacent to bituminous curb prior to reclamation process.
  - 2. Haul and dispose of stripped material off of the Site.

### 3.10 FIELD QUALITY CONTROL

- A. The Owner shall have an independent testing laboratory perform the following tests. The location of the tests shall be determined by the Engineer:
  - 1. Aggregate Backfill Material: 1 gradation test per 1,000 tons of material placed.
  - 2. 1 density test, monitored by Specified Density Method (nuclear), per 2,000 square yard of street constructed.

## **END OF SECTION**



## **SECTION 31 23 13**

### **SUBGRADE PREPARATION**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Grading, shaping, and compacting subgrade prior to placing aggregate base or aggregate backfill materials.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Subgrade Preparation: Measurement shall be by the units of square yards and shall be based on the width of the aggregate base as shown on the drawings, except as modified below. Payment at the Unit Price shall include all costs related to performing the Work in accordance with these Specifications, including shaping, grading, compacting, and tolerancing.
  - 2. Subgrade Preparation - Trail or Sidewalk: Measurement shall be by the units of square yards and shall be based on a width of 1 foot behind the edge of trail or sidewalk, except as modified below. Payment at the Unit Price shall include all costs related to performing the Work in accordance with these Specifications, including shaping, grading, compacting, and tolerancing.
  - 3. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 REFERENCES**

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.):
  - 1. 2106 – Excavation and Embankment – Compacted Volume Method.
  - 2. 2111 – Test Rolling.
  - 3. 2112 – Subgrade Preparation

##### **1.04 SEQUENCING AND SCHEDULING**

- A. Perform subgrade preparation prior to placement of the aggregate base or aggregate backfill material.
- B. Complete subgrade preparation for streets, driveways, walks, and parking lots immediately after installation of pipe as part of trench backfill and compaction.

##### **1.05 DEFINITIONS**

- A. Subgrade Preparation – grading, shaping, and compacting existing soil below the top of subgrade as defined in MnDOT Spec. 2106.1.A.2.

## **PART 2 PRODUCTS**

Not Used.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Subgrade preparations shall be performed to produce the required density, grade, and cross-section.

### **3.02 PREPARATION**

- A. Test roll subgrade conforming to MnDOT Spec. 2111, or as modified herein:
  - 1. The equipment used for test rolling shall be a Tandem Truck with a gross weight of 45,000 pounds.
  - 2. If rutting is greater than 1/2 inch, sub-grade excavation and aggregate backfill will be required.

### **3.03 COMPACTION**

- A. Conform to MnDOT Spec. 2106.3.F.1, or as modified herein:
  - 1. For the Specified Density Method, the Engineer will sample and test the soils to determine the Maximum Density and Optimum Moisture.
  - 2. The Owner will have an independent testing laboratory perform the following test, as minimum. The tests will be taken on the compacted subgrade at the location and testing rates designated by the Engineer. Nuclear density testing shall be considered an approved method:
    - a) 1 density test for every 600 feet of street in the upper 3 feet of subgrade (100 percent density zone) at varying distances either side of centerline. Note: This is done if sub-grade excavation is not required.

### **3.04 FINISH OPERATIONS**

- A. Subgrade tolerance shall conform to MnDOT Spec. 2112.3.E:

**END OF SECTION**

**SECTION 32 11 23**  
**AGGREGATE BASE COURSES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Requirements for aggregate base course on a prepared subgrade and gravel driveway patching.
- B. Related Sections:
  - 1. Section 31 23 00 - Excavation and Fill
  - 2. Section 32 23 13 - Subgrade Preparation

**1.02 PRICE AND PAYMENT PROCEDURE**

- A. Conform to MnDOT Spec. 2211.4 and 2211.5 for measurement and payment or as modified herein:
  - 1. Aggregate Base, Class 5: This Bid Item is for aggregate base placed in the streets. Measurement will be by the ton of material compacted in place as determined from weight tickets delivered to the Engineer.
  - 2. Aggregate Base, Class 5 – Trail or Sidewalk: Measurement will be by the ton of material compacted in place as determined from weight tickets delivered to the Engineer.
  - 3. Finish Grading – Street: Measurement will be by the square yard of surface area to be paved on urban street sections or by the square yard of the surface area of the aggregate graded on rural street sections.
  - 4. Finish Grading – Trail or Sidewalk: Measurement will be by the square yard of surface area of the aggregate.
  - 5. Patch Gravel Driveway: Measurement will be by the ton of material compacted in place as determined from weight tickets delivered to the Engineer. Payment will include all costs related to patching the driveway, including excavation and aggregate base.
  - 6. If the aggregate base course material is being wasted or placed excessively thick, the Owner reserves the right to deduct quantities that are in excess of Drawing thickness. Said quantities shall be based on material weighing 110 pounds per square yard of area per inch of thickness.
  - 7. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

**1.03 REFERENCES**

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.):
  - 1. 2211 - Aggregate Base
  - 2. 3138 - Aggregate for Surface and Base Courses

**1.04 SUBMITTAL**

- A. Submit gradation report on sample of aggregate base to be used.

## 1.05 DEFINITIONS

- A. Finish Grading: Grading, shaping, compacting, and tolerancing of new gravel base, existing gravel base, reclaimed material, existing gravel base that has been supplemented with Aggregate Base, or reclaimed material that has been supplemented with Aggregate Base.

## 1.06 SEQUENCING AND SCHEDULING

- A. Construct aggregate base only after all of the following have been completed:
  - 1. Subgrade excavation, common excavation, or subgrade preparation has been completed and toleranced (stringlined).
  - 2. Subgrade has been corrected for instability problems and successfully passed a "roll test" performed by the Contractor and witnessed by the Engineer, and checked for conformance to line and grade tolerances (string lined).
  - 3. The Boulevard has been graded to within 6 inches of finished grade per typical section.
  - 4. Minimum 400 LF of roadway aggregate backfill has been placed, compacted, shaped, graded, and checked for conformance to line and grade tolerances (string lined).
- B. Provide notice by 3:00 pm of any aggregate base placement for the following day, to allow time for scheduling aggregate backfill compaction testing prior to any aggregate base being placed.
- C. Final grading and shaping of gravel base prior to placing bituminous surface shall not be performed until initial curb backfilling is complete.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Street:
  - 1. Aggregate Base: Conform to MnDOT Spec. 3138.2.B Virgin class 5 aggregate or 3138.2.C Recycled class 5 aggregate, except as modified herein:
    - a. Modify Table 3138-2 to add: maximum percentage recycled concrete shall be 30%.
  - 2. Aggregate Base: Conform to MnDOT Spec. 3138.2.E(1) Table 3138-3, except as modified herein:
    - a. Modify Table 3138-3 to add: maximum percentage recycled concrete shall be 30%.
- B. Trail, and Sidewalk & Driveway:
  - 1. Aggregate Base: Conform to MnDOT Spec. 3138.2.B Virgin class 5 aggregate, or 3138.2.C Recycled class 5 aggregate, except as modified herein:
    - a. Modify Table 3138-2 to add: maximum percentage recycled concrete shall be 30%.
  - 2. Aggregate Base: Conform to MnDOT Spec. 3138.2.E(1) Table 3138-3, except as modified herein:
    - a. Modify Table 3138-3 to add: maximum percentage recycled concrete shall be 30%.
- C. Driveway and Shouldering:
  - 1. Aggregate Base: Conform to MnDOT Spec. 3138.2.B Virgin class 2 aggregate.
  - 2. Aggregate Base: Conform to MnDOT Spec. 3138.2.E, Table 3138-3 for gradation requirements.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Finish Grading:
  - 1. Grading and Shaping Aggregate Base shall be considered grading, shaping, compacting, and tolerancing material from 0 to 2 inch depth.

### **3.02 PREPARATION**

- A. Street:
  - 1. Prepare the subgrade in accordance with Section 31 23 13.
  - 2. Prepare the surface of the aggregate backfill in accordance with Section 31 23 00.
- B. Subgrade or surface of aggregate backfill to be completed and approved by the Engineer prior to installation of aggregate base.

### **3.03 CONSTRUCTION REQUIREMENTS**

- A. Conform to MnDOT Spec. 2211.3:
  - 1. Compaction shall conform to 2211.3.D.2.c (Table 2211-3) Penetration Index Method or Specified Density (100% Standard Proctor Density) as directed by the Engineer.
  - 2. Pneumatic Roller is required for compaction on all aggregate base courses.
  - 3. Install aggregate base in accordance with details on Drawings.
  - 4. Deliver weight tickets to Engineer daily.
  - 5. Patch gravel driveways to the thickness shown on the Drawings.

### **3.04 FIELD QUALITY CONTROL**

- A. The Owner shall perform Agency Verification Testing (VT) by use of an independent testing laboratory to sample the aggregate base materials, determine the moisture/density relationships, gradations, and perform field moisture tests and field density (DCP) tests at locations determined by Engineer. The following are minimum testing rates:
  - 1. One gradation test per 500 ton of material placed.
  - 2. One density test per 2,000 square yards of gravel surface, minimum 3 DCP tests per Project.
  - 3. One moisture test per Project during compaction.
  - 4. Density testing (DCP) at the curb lines prior to concrete curb and gutter placement is at the discretion of the Engineer.
- B. The Owner shall perform Agency Verification Testing (VT) by use of an independent testing laboratory to sample reclaimed gravel base materials, determine the moisture/density relationships, gradations, and perform field moisture tests and field density tests (DCP) at locations determined by Engineer. The following are minimum testing rates:
  - 1. One gradation test per 500 ton of material placed.
  - 2. One density test per 2,000 square yards of gravel surface, minimum 3 DCP tests per Project. Full depth reclamation (Shear Strength Method) DCP testing if depth of reclaimed gravel is greater than 8 inches.
- C. The Owner will not allow a "Roll Test" as a method of measuring acceptance of the final aggregate base surface.

- D. Line and Grade Tolerance for Aggregate Base or Reclaimed Aggregate Base: The final aggregate base or reclaimed aggregate base surface will be checked for conformance to specified tolerances by the "stringline" method. Grade shall be  $\pm 0.03$  feet of grade. Notify Engineer a minimum of 4 hours (one half day) prior to paving to allow for the "Field Quality Control" tolerance check.
- E. Line and Grade Tolerance for Trail and Sidewalk: The final aggregate base surface needs to be graded and toleranced. Grade tolerance shall be  $\pm 3/8$  inch as measured with a 10-foot straight edge. Notify Engineer a minimum of 4 hours (one half day) prior to paving to allow for the "Field Quality Control" tolerance check.

### 3.05 PROTECTION

- A. Protect aggregate base until it is covered by surface pavement.
- B. Keep aggregate base free of ruts and irregularities until covered by surface paving.
- C. Place water on aggregate base for dust control as required, to eliminate nuisance conditions for adjacent properties.

## END OF SECTION

## **SECTION 32 11 25**

### **FULL DEPTH RECLAMATION**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Reclamation of the existing bituminous surfacing and a portion of the underlying existing base material.
- B. Related Sections:
  - 1. Section 31 23 00 - Excavation and Fill
  - 2. Section 31 23 13 - Subgrade Preparation

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Full Depth Reclamation: Measurement will be by the square yard, based on the width of the existing pavement, regardless of depth of reclamation required:
    - a. Payment for leveling and compaction of the material immediately after it is reclaimed is to be included in the Bid Unit Price per square yard.
    - b. The Bid Unit Price is to include the motor grader and any water necessary to maintain the reclaimed material until paved.
  - 2. Finish grading and tolerancing of reclaimed material prior to paving shall be per Section 32 11 23 Aggregate Base Course.
  - 3. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 SEQUENCING AND SCHEDULING**

- A. Reclamation will be performed at locations shown on the drawings.
- B. Provide a 48-hours notice prior to beginning the reclamation process.
- C. Initial grading/leveling and interim compaction of the reclaimed material by a motor grader and rubber-tired roller is required immediately following the reclamation process.
- D. Maintain access to all residents during the reclamation and tolerancing process.

#### **PART 2 PRODUCTS**

##### **2.01 MATERIALS**

- A. Reclaimed material – Pulverized Aggregate:
  - 1. Pulverize the full depth of the existing bituminous material, and underlying base materials until 97% or more pass the 37.5mm (1.5 inch) sieve size.

B. Contractor's Gradation Quality Control (QC):

1. The Contractor shall be responsible for gradation control by testing the reclaimed material at a rate of 1 test per 5,000 square yards, with a minimum 1 test per day.
2. Provide the Engineer a verification sample for Quality Assurance testing at the discretion of the Engineer. This shall be a split sample taken by the Contractor.

### **PART 3 EXECUTION**

#### **3.01 GENERAL**

- A. Create an aggregate base course composed of the existing bituminous pavement and a portion of the existing underlying base material.
- B. The reclamation process cannot be performed during rain events. Compact reclaimed material prior to rain events.
- C. Disposal of the oversize bituminous pieces, within the Right-of-Way, will not be permitted. Any oversize bituminous pieces found in the Right-of-Way shall be removed by the Contractor and at the Contractor's expense.
- D. Access to all residents shall be maintained during the reclamation and tolerancing process.
- E. The resulting reclaimed material could contain diesel range organics (DRO) which must be disposed of in accordance with MPCA requirements.

#### **3.02 PREPARATION**

- A. Finish grading, compaction, and tolerancing of the reclaimed material shall be per Section 32 11 23 Aggregate Base Course.
- B. Removal of excess reclaimed material shall be per section 31 23 00 Remove grass and other vegetation from the edge of the existing pavement to prevent contamination of the pulverized material during the reclamation process. Remove this material per Section 31 23 00.

#### **3.03 COMPACTION**

- A. Compaction of the reclaimed material shall conform to Section 32 11 23 Aggregate Base Course, 3.03.A.
- B. Control moisture content of reclaimed material 3 to 7 percent by dry weight during the initial leveling/compaction and final shaping and tolerancing process as incidental to reclamation.
- C. The maximum reclaimed layer thickness for compaction shall be 8 inches.

#### **3.04 EQUIPMENT**

- A. Notify the Engineer of the equipment to be used at the preconstruction conference:
  1. Equipment to be hydrostatically driven.
  2. Computerized operation controls.
  3. Rotating cutter drum to operate parallel to the existing road surface, providing a uniform section across the entire roadway.



4. Capable of cutting up to a 12 inch depth in 1 pass.
5. Uniformly blend the pulverized material.
6. Equipment exhaust must be on the top and not the side.

### 3.05 THICKNESS REQUIREMENTS

- A. Typical reclaimed section varies. Refer to typical sections on Drawings.

**END OF SECTION**

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**SECTION 32 12 01**  
**FLEXIBLE PAVING (MUNICIPAL PROJECTS)**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Hot plant mixed asphalt-aggregate mixtures for wearing and non-wearing courses.
  - 2. Bituminous tack coat.
- B. Related Sections:
  - 1. Section 01 57 13 - Temporary Erosion and Sediment Control
  - 2. Section 02 41 13 - Selective Site Demolition
  - 3. Section 31 23 00 - Excavation and Fill
  - 4. Section 32 11 23 - Aggregate Base Courses
  - 5. Section 33 05 17 - Adjust Miscellaneous Structures

**1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Method of measurement and payment shall conform to MnDOT Specification 2360.4 and 2360.5, except as modified herein.
  - 2. Bituminous Material for Tack Coat:
    - a. Measured by volume in gallons at 60 degrees F.
    - b. Payment for bituminous material used for Tack Coat includes compensation in full for all costs incidental to the furnishing and application at the Bid Unit Price per gallon.
    - c. Cleaning of all debris and dirt from the previous bituminous surfaces prior to placement of Tack Coat is included in the Bid Unit Price for Tack Coat.
    - d. Payment for the accepted quantity of asphalt emulsion shall be at the Contract price per unit of measure for undiluted asphalt emulsion.
    - e. Payment for tacking exposed edges of existing bituminous surfaces and concrete curb and gutter in conjunction with initial lift placement is considered incidental to the placement of the initial lift.
  - 3. Bituminous mixtures:
    - a. Measured by the weight in tons of material placed and accepted for each specified Bid Item as stated in the Bid Form. Payment shall be made in accordance with the acceptance and payment schedules provided in MnDOT Specification 2360 Plant Mixed Asphalt Pavement.
    - b. The Bid Unit Price includes both the bituminous course mixture and asphalt binder material.
    - c. Partial payment will not exceed 70 percent of the total calculated payment until the required testing and product documentation is received and found to be acceptable to the Engineer.
    - d. Payment for the bituminous final lift will not be made until the corresponding signing and pavement markings have been installed.
    - e. No recycled material is allowed in Bid Items labeled special.
  - 4. Type SP 12.5 Non Wearing Course Mixture (2,B), Including Integral Bituminous Curb:
    - a. Measurement will be by weight in tons of material placed and accepted, either as pavement or curb. Payment shall be made in accordance with the acceptance and payment schedules provided in MnDOT Specification 2360 Plant Mixed Asphalt Pavement.

- b. The Unit Price includes both the bituminous course mixture and asphalt binder material.
  - c. Partial payment will not exceed 70 percent of the total calculated payment until the required testing and product documentation is received and found to be acceptable to the Engineer.
- 5. Preparation of Bituminous Initial Lift consists of final clean up of the bituminous initial lift prior to paving final lift:
  - a. Street Sweeper with power pickup broom, including operator: per hour.
  - b. Skidsteer (Bobcat), including operator: per hour
- 6. Patch Bituminous Driveway and Patch Bituminous Trail: Measurement will be by the square yard. Payment will include all costs related to patching the driveway or trail to the thicknesses shown on the Drawings, including excavation, subgrade preparation, aggregate base, and the bituminous wearing course:
  - a. Saw cutting just prior to paving will be paid separately, per Section 02 41 13.
  - b. Removing bituminous pavement will be paid separately, per Section 02 41 13.
- 7. Remove and Replace Bituminous Driveway and Remove and Replace Bituminous Trail: Measurement will be by the square yard. Payment will include all costs related to patching the driveway or trail to the thicknesses shown on the Drawings, including sawcutting just prior to paving per Section 02 41 13, removing bituminous pavement per Section 02 41 13, excavation and subgrade preparation, aggregate base, and the bituminous wearing course.
- 8. Patch Bituminous Street: Measurement will be by the square yard. Payment will include all costs related to patching the street to the thicknesses shown on the Drawings, including excavation, aggregate backfill, Class 5 aggregate base, bituminous initial lift(s), tack coat(s), and bituminous final lift:
  - a. Saw cutting just prior to paving will be paid separately, per Section 02 41 13.
  - b. Removing bituminous pavement will be paid separately, per Section 02 41 13.
- 9. Remove and Replace Bituminous Street: Measurement will be by the square yard. Payment will include all costs related to patching the street to the thicknesses shown on the Drawings, including sawcutting just prior to paving per Section 02 41 13, removing bituminous pavement per Section 02 41 13, excavation and subgrade preparation, aggregate backfill, Class 5 aggregate base, bituminous initial lift(s), tack coat(s), and bituminous final lift.
- 10. Bituminous Wedge: Measurement will be by weight in tons of material placed and accepted. Payment will include all costs related to constructing the Bituminous Wedge per the Standard Detail and as specified:
  - a. Silt fence placed behind the curb and adjacent to the Bituminous Wedge will be paid per Section 01 57 13.
- 11. Bituminous sawcutting or milling that is required for joint construction will be paid per Section 02 41 13:
  - a. Removal of temporary bituminous ramps is considered incidental to the sawing bituminous pavement or milling Bid Item.
- 12. Bituminous Incentive and Disincentive Allowance: The allowance indicated in the Bid Form is maximum incentive based on the Engineer's estimated unit prices for the various bituminous bid items. The final incentive and disincentive will be based on the actual unit prices in the contract award. Payment will be based on the actual incentive or disincentive determined under MnDOT Spec Section 2360.3.D.1q, for bituminous placed per section 3.05 Pavement Density. Example: if the allowance in the Bid Form is \$10,000 and the incentive is determined by the Engineer to be \$2,500, a quantity of 0.25 will be paid under the lump sum bid item, resulting in a total price of \$2,500 (i.e.  $\$10,000 \times 0.25 = \$2,500$ ). Similarly, if a disincentive is determined to be \$1,525, a quantity of -0.1525 will be paid, resulting in an amount of -\$1,525 (i.e.  $\$10,000 \times -0.1525 = -\$1,525$ ).
- 13. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. Minnesota Department of Transportation "Standard Specifications for Construction" and "Materials Lab Supplemental Specifications For Construction" 2018 Edition (MnDOT Spec.):
  - 1. 2360 – Plant Mixed Asphalt Pavement:
    - a. Within this document replace the words "Department Bituminous Engineer" or "District Materials Engineer" with the word "Engineer".
  - 2. 2357 - Bituminous Tack Coat
  - 3. 3139 – Graded Aggregate for Bituminous Mixtures

### 1.04 SUBMITTALS

- A. Submit mixture design report to the Engineer. Conform to MnDOT Spec. 2360.2.E.5.b(2), 2360.2.E.9, 2360.2.F, 2360.2.G.8.
- B. Submit mix design report for all projects, regardless of the size of the project.
- C. Submit Q/C results in accordance with MnDOT Spec. 2360.2.G.1, 2360.2.G.4 and MnDOT's most recent Materials Control Schedule.
- D. Submit Q/C testing for Class B aggregates included in mix designs based on the following schedule:
  - 1. For every 5,000 tons of bituminous mixture placed on the project, or for mix placed 30 days after the previous submittal, perform and submit the following Q/C testing from Class B aggregate stockpile:
    - a. Soundness Testing (ASTM C 88)
    - b. Loss by Abrasion and Impact (ASTM C 131)
  - 2. Aggregate testing requirements shall be submitted on a per project basis. Individual tests and submittals are required for each project.

### 1.05 SEQUENCING AND SCHEDULING

- A. Prime Contractor is responsible for scheduling an onsite pre-paving meeting with the Owner, Engineer, Paving Subcontractor (if appropriate), including the Paving Forman a minimum 24 hours prior to the paving operations.
- B. Provide 48-hour notice for scheduling and noticing of the residents prior to paving operations.
- C. Provide notice by 2:00 pm the day prior to any bituminous placement to allow for scheduling of the following activities. Notice must include mix designation, start time of placement, plant producing mix, and Forman onsite during paving operations:
  - 1. Aggregate base DCP tests (per Section 32 11 23 - Aggregate Base Courses) prior to any bituminous being placed.
  - 2. Inspection of paving operations by a City representative, no paving will be allowed or accepted without inspection.
  - 3. Bituminous plant testing if required
- D. Aggregate base and concrete curb and gutter to be completed and approved by the Engineer prior to placement of bituminous surfaces.
- E. Concrete pedestrian ramps to be completed and approved by the Engineer prior to placement of bituminous trail:

1. Concrete pedestrian ramps must be protected during paving of bituminous trail. Method of protection must be approved by the Engineer.
- F. Sweeping of pavement must occur immediately prior to placement of the final lift. Swept surface must be approved by the Engineer prior to the placement of the final lift.
- G. Adjust structures prior to placement of bituminous wedge as specified in Section 33 05 17.
- H. Bituminous wedge must start no sooner than one week after placement of initial wearing course lift and must be completed before private utility installation begins and within two weeks of placement of the initial wearing course lift.
- I. Adjust structures prior to placement of bituminous final lift as specified in Section 33 05 17.
- J. Bituminous cores for testing shall be taken 12 to 48 hours after paving operations.
- K. Patch bituminous driveways within 7 calendar days of initial removal, or per applicable Milestones in Section 00 52 10 – Agreement, Paragraph 4.02.A.1.
- L. Sidewalks, trails, and final restoration must be completed prior to final lift paving.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Mixture Designation: Conform to MnDOT 2360.1.A, except as modified in the typical section and Bid Form:
  1. Residential Streets (Low Volume):
    - a. Wearing Course (Final Lift) = SPWEA330C.
    - b. Wearing Course (Initial Lift) = SPWEB330C.
  2. Trails, Full Driveways, Parking Lots, and Street Patching = SPWEA240C.
  3. Bituminous Wedge = SPNWA230B.
  4. Driveway Patching = SPWEA230C.
- B. Conform to MnDOT Section 2360.2 and 3139 Graded Aggregate for Bituminous Mixtures except as modified herein:
  1. Recycled Asphalt Shingles (RAS), MnDOT 3139.2.B.8, are not allowed in the wearing course mixtures.
  2. Ash, MnDOT 3139.2.B.10 will not be allowed in the wearing course mixtures.
- C. Bituminous Tack Coat:
  1. Bituminous Material: Conform to MnDOT Spec. 2357:
    - a. Emulsified Asphalt, Cationic, CSS-1 or CSS-1h.
- D. Asphalt Binder Material: Conform to MnDOT Spec. 2360.2B, Table 2360-2, Spec. 3151 and as identified in the Mix Designation.
- E. Mixture Design: Conform to MnDOT Spec. 2360.2.E.
- F. Mixture Quality Management (Quality Control/Quality Assurance): Conform to MnDOT Spec. 2360.2.G., except as modified herein:
  1. Quality Assurance testing will be completed at the discretion of the Engineer, testing rates will not exceed Table 2360.-10 and 2360.11.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Conform to the requirements of MnDOT Spec. 2360.3, except as modified herein.
- B. Review the proposed paving sequence with the Engineer prior to placement of each bituminous course (lift).
- C. The proposed sequence shall address the: longitudinal seams, compaction, traffic control, hauling routes, and placement of pavement markings.
- D. Preparation of Bituminous Lower Lift:
  - 1. Final clean up of the bituminous surface with the use of a power pickup broom and front end loader/skidsteer.
  - 2. Street sweeping operations must include the application of water to effectively make the pavement free and clear of material and debris to allow for successful application and adhesion of bituminous tack coat to the pavement. The appropriate amount of water shall be applied, eliminating dust as part of the sweeping operations.
- E. Adjust structures conforming to the requirements of Section 33 05 17:
  - 1. Have a valve wrench on site during the paving operations for the purpose of final adjustments to the valve boxes to meet the specified tolerances. This work shall be considered incidental to the valve box adjustment bid item.
- F. Joints: Where new construction meets existing bituminous surfacing, the existing surface shall be uniformly milled or saw-cut straight, and bituminous tack coat applied prior to placement of each bituminous course (lift):
  - 1. For joint construction, an existing bituminous surface shall be considered to include any bituminous surface not paved on the same day as the new construction. The Owner may require milling or sawcutting on surfaces paved the same day, if, in the opinion of the Owner, the mix has cooled to a point where a new milled or sawed edge is necessary
  - 2. Construct 2-foot wide (min.) ramp where new construction does not match existing construction (i.e. initial lift to final lift).
  - 3. Longitudinal Joints: Utilize Maryland Joint construction method.
- G. Finish bituminous surface shall be flush with concrete surface at curb depression for pedestrian curb ramps.

### **3.02 RESTRICTIONS**

- A. Conform to MnDOT Section 2360.3.A, except as modified herein.
- B. Following the street sweeping operations, the condition of the pavement surface must be approved by the Engineer prior to paving.
- C. Existing bituminous surfaces must be dry prior and during placement of any bituminous pavements.
- D. Bituminous surfaces shall not be constructed on frozen gravel base.

- E. Final Lift shall not be placed when the air temperature in the shade and away from artificial heat is 50 degrees or less, unless otherwise approved by City Engineer.

### 3.03 EQUIPMENT

- A. Conform to MnDOT Section 2360.3.B, except as modified herein.
  - 1. Patching bituminous trails greater than 20 feet in length requires the use of a self-propelled paver.
  - 2. Patching bituminous street greater than 20 feet in length and 10 feet in width requires the use of a self-propelled paver.

### 3.04 TREATMENT OF SURFACE

- A. Bituminous Tack coat shall conform to MnDOT Spec. 2357, except as modified herein.
- B. Restrictions:
  - 1. The tack coat shall not be applied when the road surface is wet or when the weather conditions are unsuitable.
  - 2. The area for tack coat application shall be limited as directed by the Engineer.
  - 3. The Contractor shall have sole responsibility of claims of tack coat on personal property due to lack of notification or signage of the area being tack coated.
  - 4. No tack coat prior to placement of bituminous wedge.
  - 5. Cleanup of tack coat material tracked and build up onto adjacent roadway surfaces by truck hauling shall be performed on a daily basis, or as directed by the Engineer.
- C. Distributor Equipment: Conform to MnDOT Spec. 2360.3.B.2.d, except as modified herein:
  - 1. The Engineer at anytime can direct the Contractor to perform test strip to determine if the equipment is applying the specified application rate for the emulsion. All cost associated with this test strip is considered incidental to the tack application.
- D. Road Surface Preparation: Conform to MnDOT Spec. 2357.3.C.
- E. Application:
  - 1. At a uniform rate conforming to MnDOT Spec. 2357.3.D, but not greater than 0.07 gallon per square yard, new asphalt.
  - 2. Along the front edge of the concrete curb and gutter, prior to placement of bituminous initial lift.

### 3.05 PAVEMENT DENSITY

- A. Conform to MnDOT Section 2360.3.D, except as modified herein:
  - 1. Trails, Driveways, Small Parking Lots, Leveling Courses, Bituminous Wedge, Interim Bituminous Mat with Integral Bituminous Curb, and Patching shall conform to Section 2360.D.2 – Ordinary Compaction Method.
  - 2. All other Pavement Density shall conform to Section 2360.3.D.1 – Maximum Density Method.
  - 3. Modify Table 2360.3.D.1.g Lot Determination as indicated below:
    - a. Daily production 0 to 200 tons is at the discretion of the Engineer.
  - 4. Modify 2360.3.D.1.i Contractor Core Testing:
    - a. Finished surface of compacted mix placed into coring hole shall be smooth and consistent with adjacent mat. Re-coring and patching of the core hole shall be at the discretion of the Engineer.



- B. Longitudinal Joint Density, delete the following:
  - 1. 2360.3.D.1.n Longitudinal Joint Density
  - 2. 2360.3.D.1.p Shoulders
  - 3. Table 2360-20, Table 2360-24, and Table 2360-25
  - 4. 2360.3.D.1.r Pay Factor Determination

### 3.06 THICKNESS AND SURFACE SMOOTHNESS REQUIREMENTS

- A. Conform to MnDOT Section 2360.3.E, except as modified herein:
  - 1. Pavement smoothness requirements of 2399 (Pavement Smoothness) will not apply to this Project.
- B. Structure Adjustment – Conform to Section 33 05 17 for tolerances.

### 3.07 TEMPORARY BITUMINOUS WEDGE

- A. Where concrete curb and gutter is installed, construct a temporary bituminous mat meeting the following requirements:
  - 1. Construct with non-wearing course (SP9.5).
  - 2. 8 or 10 feet wide from front edge of concrete curb and gutter.
  - 3. Thickness to be 1/4 inch over curb and taper to meet the non wear course base course mat elevation.
- B. Install machine sliced heavy duty silt fence behind curb adjacent to bituminous wedge per Section 01 57 13 and the Standard Detail.

### 3.08 PATCH BITUMINOUS STREET, DRIVEWAY, OR TRAIL

- A. Perform patching at locations shown on the Drawings or as directed by Engineer.
- B. Remove existing bituminous per Section 02 41 13.
- C. Saw cut existing bituminous per Section 02 41 13.
- D. Excavate to the bottom of the aggregate base or aggregate backfill layer as shown on the Drawings and dispose of material per Section 31 23 00.
- E. Place aggregate backfill, as required, per Section 31 23 00.
- F. Place aggregate base per Section 32 11 23.
- G. Place bituminous pavement.

## END OF SECTION

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## **SECTION 32 13 14**

### **CONCRETE WALKS, MEDIANS, AND DRIVEWAYS**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

**A. Section Includes:**

1. Cast-in-place concrete walkways, medians, driveways, and valley gutters.

**B. Related Sections:**

1. Section 02 41 13 - Selective Site Demolition
2. Section 31 23 00 - Excavation and Fill.
3. Section 31 23 13 - Subgrade Preparation.
4. Section 32 11 23 – Aggregate Base Courses.
5. Section 32 16 13 - Concrete Curbs and Gutters.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

**A. Measurement and Payment:**

1. 6-Inch Thick Concrete Sidewalk: Measurement shall be on the basis of in-place square yard:
  - a. Payment of the Bid Item shall include the following:
    - 1) Concrete materials.
    - 2) Subgrade and base preparation.
    - 3) Placement of materials.
    - 4) Finishing.
    - 5) Curing and protection.
    - 6) Backfilling.
  - b. Excavation for concrete sidewalk shall be measured and compensated per Section 31 23 00.
  - c. Aggregate base beneath concrete sidewalk shall be measured and compensated per Section 32 11 23.
2. Remove and Replace 6-Inch Thick Concrete Sidewalk: This Bid Item shall be used for all concrete sidewalk removed and replaced on this Project without regard to thickness and is assumed to be all hand placed. Measurement shall be on the basis of in-place square yard of sidewalk removed and replaced:
  - a. Payment of the Bid Item shall include the following:
    - 1) Sawcutting at the removal limits.
    - 2) Removal and disposal of existing concrete and excess aggregate materials per Section 02 41 13.
    - 3) Excavation and subgrade preparation.
    - 4) Aggregate base placement and preparation.
    - 5) Concrete materials.
    - 6) Placement of materials.
    - 7) Labor and equipment.
    - 8) Finishing.
    - 9) Curing and protection.
    - 10) Backfilling.

3. Concrete Pedestrian Curb Ramp: Measurement shall be on the basis of square feet of ramp actually constructed:
  - a. Measurement of ramp shall not include adjacent concrete curb and gutter, which shall be measured and compensated separately.
  - b. Payment shall include the following:
    - 1) Sawcutting and removal of existing bituminous trail pavement, and disposal of excess material off the Site.
    - 2) Aggregate base preparation.
    - 3) Concrete materials, including material under truncated dome.
    - 4) Placement of materials.
    - 5) Finishing.
    - 6) Curing and protection.
    - 7) Backfilling.
4. Remove and Replace Concrete Pedestrian Curb Ramp:
  - a. Measurement of ramp shall be the final finished square feet of concrete placed.
  - b. Measurement of ramp shall not include adjacent concrete curb and gutter, which shall be measured and compensated separately.
  - c. Payment shall include the following:
    - 1) Sawcutting and removal of existing concrete pedestrian ramp, existing concrete sidewalk, or existing bituminous trail required to achieve the final size and shape as directed by the Engineer.
    - 2) Removal and disposal of existing concrete and excess aggregate materials per Section 02 41 13.
    - 3) Excavation and subgrade preparation.
    - 4) Aggregate base placement and preparation.
    - 5) Concrete materials, including material under truncated dome.
    - 6) Placement of materials.
    - 7) Labor and equipment.
    - 8) Finishing.
    - 9) Curing and protection.
    - 10) Backfilling.
5. Truncated Dome Panel, which is part of the concrete pedestrian curb ramp: Measurement shall be on the basis of square feet of Truncated Dome Panels actually constructed:
  - a. Payment shall include the following:
    - 1) Truncated panel materials.
    - 2) Placement of truncated panels.
    - 3) Joint sealing material.
    - 4) Protection of truncated panels during construction.
  - b. Radial Truncated domes will be measured along the long cord and multiplied by 2 feet to compute S.F.
6. 6 Inch Thick Concrete Driveway (Residential) and 7-Inch Thick Concrete Driveway (Commercial). Measurement shall be on the basis of in-place square yard:
  - a. Payment of the Bid Item shall include the following:
    - 1) Excavation and subgrade preparation.
    - 2) Removal and disposal of excess aggregate materials per Section 02 41 13.
    - 3) Aggregate base placement and preparation.
    - 4) Concrete materials (high early).
    - 5) Placement of materials.
    - 6) Labor and equipment.
    - 7) Finishing.
    - 8) Curing and protection.
    - 9) Backfilling

7. Remove and Replace 6 Inch Thick Concrete Driveway (Residential) and 7-Inch Thick Concrete Driveway (Commercial): Measurement shall be on the basis of in-place square yard of Concrete Driveway Apron removed and replaced:
  - a. Payment of the Bid Item shall include the following:
    - 1) Sawcutting at the removal limits.
    - 2) Removal and disposal of existing concrete pavement and excess aggregate materials per Section 02 41 13.
    - 3) Excavation and subgrade preparation.
    - 4) Aggregate base placement and preparation.
    - 5) Concrete materials (high early).
    - 6) Placement of materials.
    - 7) Labor and equipment.
    - 8) Finishing.
    - 9) Curing and protection.
    - 10) Backfilling.
8. 4-Inch Thick Concrete Median: Measurement shall be on the basis of in-place square yard:
  - a. Payment of the Bid Item shall include the following:
    - 1) Excavation.
    - 2) Aggregate base.
    - 3) Concrete materials.
    - 4) Subgrade and base preparation.
    - 5) Placement of materials.
    - 6) Finishing.
    - 7) Curing and protection.
    - 8) Backfilling.
9. Remove and Replace 4-Inch Thick Concrete Median: Measurement shall be on the basis of in-place square yard of median removed and replaced:
  - a. Payment of the Bid Item shall include the following:
    - 1) Sawcutting at the removal limits.
    - 2) Removal and disposal of existing concrete and excess aggregate materials per Section 02 41 13.
    - 3) Excavation and subgrade preparation.
    - 4) Aggregate base placement and preparation.
    - 5) Concrete materials.
    - 6) Placement of materials.
    - 7) Labor and equipment.
    - 8) Finishing.
    - 9) Curing and protection.
    - 10) Backfilling.
10. Concrete Median Approach Nose: Measurement shall be on the basis of in-place square yard:
  - a. Payment of the Bid Item shall include the following:
    - 1) Excavation.
    - 2) Aggregate base.
    - 3) Concrete materials.
    - 4) Subgrade and base preparation.
    - 5) Placement of materials.
    - 6) Finishing.
    - 7) Curing and protection.
    - 8) Backfilling.

11. Remove and Replace Concrete Median Approach Nose: Measurement shall be on the basis of in-place square yard of median approach nose removed and replaced:
  - a. Payment of the Bid Item shall include the following:
    - 1) Sawcutting at the removal limits.
    - 2) Removal and disposal of existing concrete and excess aggregate materials per Section 02 41 13.
    - 3) Excavation and subgrade preparation.
    - 4) Aggregate base placement and preparation.
    - 5) Concrete materials.
    - 6) Placement of materials.
    - 7) Labor and equipment.
    - 8) Finishing.
    - 9) Curing and protection.
    - 10) Backfilling.
12. Concrete Valley Gutter: Measurement shall be on the basis of in-place square yard:
  - a. Payment of the Bid Item shall include the following:
    - 1) Sawcutting of existing pavement.
    - 2) Removal and disposal of existing bituminous and all excess materials per Section 02 41 13.
    - 3) Excavation and subgrade preparation.
    - 4) Aggregate base.
    - 5) Concrete materials (high early).
    - 6) Subgrade and aggregate base preparation.
    - 7) Placement of materials.
    - 8) Reinforcement.
    - 9) Finishing.
    - 10) Curing and protection.
    - 11) Patch adjacent bituminous street
13. Remove and Replace Concrete Valley Gutter: Measurement shall be on the basis of in-place square yard:
  - a. Payment of the Bid Item shall include the following:
    - 1) Sawcutting of existing pavement.
    - 2) Removal and disposal of existing concrete, bituminous, and excess aggregate materials per Section 02 41 13.
    - 3) Excavation and subgrade preparation.
    - 4) Aggregate base.
    - 5) Concrete materials (high early).
    - 6) Subgrade and aggregate base preparation.
    - 7) Placement of materials.
    - 8) Reinforcement.
    - 9) Finishing.
    - 10) Curing and protection.
    - 11) Patch adjacent bituminous street
14. High Capacity Concrete Apron: Measurement shall be on the basis of each:
  - a. Payment of the Bid Item shall include the following:
    - 1) Aggregate base.
    - 2) Concrete materials. (6" thick)
    - 3) Subgrade and aggregate base preparation.
    - 4) Placement of materials.
    - 5) Reinforcement.
    - 6) Finishing.
    - 7) Curing and protection.
    - 8) Backfilling.

15. Concrete Spillway: Measurement will be by the square foot of spillway constructed:
  - a. Payment of the Bid Item shall include the following:
    - 1) Excavation and subgrade preparation.
    - 2) Removal and disposal of all excess materials per Section 02 41 13.
    - 3) Aggregate base placement and preparation.
    - 4) Concrete materials.
    - 5) Placement of materials.
    - 6) Labor and equipment.
    - 7) Finishing.
    - 8) Curing and protection.
    - 9) Backfilling.
16. 7" Concrete Truck Apron: Measurement shall be on the basis of in-place square yard:
  - a. Payment of the Bid Item shall include the following:
    - 1) Concrete materials and tie bars.
    - 2) Subgrade and base preparation.
    - 3) Placement of materials.
    - 4) Placement of tie bars at 36" spacing o.c. between the concrete pavement and any adjacent curb and gutter.
    - 5) Finishing.
    - 6) Curing and protection.
    - 7) Backfilling
  - b. Aggregate base beneath concrete pavement shall be measured and compensated per Section 32 11 23.
17. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. American Society of Testing Materials (ASTM):
  1. C260 - Air-Entraining Admixtures for Concrete.
- B. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.):
  1. 2211 - Aggregate Base.
  2. 2461 - Structural Concrete.
  3. 2521 - Walks.
  4. 2531 - Concrete Curbing.
  5. 3702 - Preformed Joint Fillers.
  6. 3754 - Membrane Curing Compound.

### 1.04 SUBMITTALS

- A. Submit MnDOT approved design mix for each concrete mix designation used. If a MnDOT approved mix design is unavailable, the Engineer will establish the job mix proportions.

### 1.05 SEQUENCING AND SCHEDULING

- A. Prime Contractor is responsible for scheduling an onsite pre-pour meeting with the Owner, Engineer, Concrete Subcontractor (if appropriate), including the Concrete Forman a minimum 24 hours prior to the paving operations.

- B. Provide notice by 2:00 pm of the day prior to any concrete placement to allow for scheduling of the following activities. Notice must include mix designation, start time of placement, plant producing concrete, and Forman onsite during placement:
  - 1. Aggregate base DCP tests (per Section 32 11 23 - Aggregate Base Courses) prior to any concrete being placed.
  - 2. Inspection of concrete placement by a City representative, no concrete placement will be allowed or accepted without inspection.
  - 3. Concrete field and plant testing if required
- C. Complete construction of concrete pedestrian ramps prior to the paving of bituminous path and construction of the concrete sidewalk.
- D. Complete construction of concrete sidewalks following the paving of the bituminous initial lift wearing course and following the installation of Private Utilities.
- E. Begin construction of the concrete driveway aprons or medians no sooner than 24 hours after placement of the adjacent concrete curb and gutter with completion within 5 days of curb placement, or per applicable in Milestones per Section 00 52 10 – Agreement, Paragraph 4.02.A.1.
- F. Construct concrete valley gutter after bituminous initial lift placement and prior to placement of bituminous final lift:
  - 1. On street rehabilitation projects, Valley Gutters shall be constructed in halves to provide access for residents.
- G. Complete concrete driveways to allow access to driveway within 7 calendar days, beginning on the day of the removals, or per applicable in Milestones per Section 00 52 10 – Agreement, Paragraph 4.02.A.1.
- H. All concrete placed after October 1 must be high early strength concrete, unless otherwise approved by City Engineer.
- I. Concrete placement will not be allowed after October 15, unless otherwise approved by City Engineer.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Concrete to conform to MnDOT Spec. 2461, except as modified herein:
  - 1. Portland Cement: Conform to MnDOT Spec. 3101:
    - a. Type 3 air-entraining concrete produced by using Type I Portland Cement.
  - 2. Air-Entraining Admixtures: conform to MnDOT Spec. 3113:
    - a. Conforming to ASTM C260.
    - b. Not to be added to the concrete mixtures in the field without approval from Engineer.
  - 3. Mix Designation and Classification:
    - a. Sidewalk, Driveways, Pedestrian Ramps, and Medians: Mix No. 3F52
    - b. Valley gutters: Mix No. 3HE52
- B. Truncated Dome Panels: Approved products:
  - 1. East Jordan Iron Works – Cast Iron Uncoated
  - 2. Neenah Foundry Company – Cast Iron Uncoated
  - 3. Tuftile – Cast Iron Uncoated



- C. Preformed Joint Filler: Conform to MnDOT Spec. 3702.
- D. Curing Compound: Conform to MnDOT Spec. 3754 Poly-Alpha Methylstyrene AMS:
  - 1. Curing compound shall contain a fugitive dye.
- E. Sub-Grade Base Material:
  - 1. Aggregate Backfill: Conform to Section 31 23 00.
  - 2. Aggregated Base: Conforming to Section 32 11 23.

### **PART 3 EXECUTION**

#### **3.01 GENERAL**

- A. Concrete contractor shall have at least two people with a current ACI concrete flatwork technician or flatwork finisher certification, and at least one of them must be onsite for all concrete pours.
- B. Provide copies of batch tickets for concrete mix at the time of material delivery to Site.
- C. Construct concrete sidewalk, pedestrian ramps, driveways, medians, median approach noses, and valley gutters at the locations and elevations indicated on the Drawings.
- D. Construct sidewalks and medians to conform to the typical section shown on the Drawings.
- E. Construct concrete driveway aprons to conform to Standard Detail Plates STR-8 and STR-9
- F. Construct concrete median approach nose per Standard Plate STR-38.
- G. Construct concrete valley gutters to conform to Standard Detail Plate STR-10.
- H. Construct High Capacity Concrete Apron to conform to Standard Detail Plate STR-40 and STR-41.
- I. Construct concrete curb ramp to conform to MnDOT Standard Details, current version.
- J. Verify locations with Engineer in the field prior to construction.
- K. The completed concrete work shall give the appearance of uniformity in surface contour and texture, and shall be accurately constructed to line and grade. The required joints, edges, and flow lines shall show neat workmanship. The concrete work shall be in full accordance with the Standard Detail Drawings. Any deviations from the Standard Detailed Drawings may be cause for removal and replacement at the Contractor's expense. No price reductions will be allowed as a means to correct deviations.
- L. Re-tempering of concrete which has partially hardened with or without additional materials or water is prohibited.
- M. Remove and Replace Concrete Sidewalks, Concrete Pedestrian Ramps, Concrete Driveways, Concrete Medians, Concrete Median Approach Noses:
  - 1. Perform patching at locations shown on the Drawings or as directed by the Engineer per Standard Detail STR-30.
  - 2. Remove existing concrete per Section 02 41 13.
  - 3. Saw cut existing concrete per Section 02 41 13.
  - 4. Excavate to the bottom of the aggregate base layer and dispose of the material per Section 31 23 00.

5. Place aggregate base per Section 32 11 23.
6. Place concrete pavement.

N. Construct Concrete Spillway:

1. Construct a concrete spillway at locations shown on the Drawings or as directed by the Engineer.
2. 6 inches thick (minimum).
3. 5 feet wide (minimum).
4. Construct spillway such that the storm water is conveyed directly to the bottom of the drainage way, thereby minimizing erosion in the general area.

O. Concrete washout locations shall conform to the requirements of the NPDES Permit.

### 3.02 FOUNDATION PREPARATIONS

A. Placement of the aggregate base or granular material to support the concrete work shall conform to Section 32 11 23 or Section 31 23 13. Compaction of subgrade base shall conform to MnDOT Spec. 2211.3.D.2.c.

B. The foundation shall be approved by the Engineer prior to placement of concrete material.

### 3.03 FORMS

A. Conform to MnDOT Spec. 2521.3C.

### 3.04 JOINT CONSTRUCTION

A. Conform to MnDOT Spec. 2521.3.D.2, except as modified herein:

1. Match joints of adjacent concrete work.
2. Transverse expansion joints for sidewalk:
  - a. 200' intervals.
  - b. Concrete areas that are poured separately.
3. Contraction joints shall be sawed.

### 3.05 METAL REINFORCEMENT

A. Conform to MnDOT Spec. 2531.3.F, except as modified herein:

1. Install 3 No. 4 steel reinforcing rods in lower portion of the valley gutter section with minimum 2-inches coverage on all sides.

### 3.06 PLACING AND FINISHING

A. Conform to MnDOT Spec. 2521.3.D and 2531.3.C for manual placement or 2531.3.D for slip form, except as modified herein:

1. Any deviation in the design curvature of concrete edges in excess of 3/8 of an inch, measured with a 10-foot straight edge, will be considered unacceptable.
2. Any surface area allowing the entrapment of water at a depth 1/8 inch or greater will be considered unacceptable.
3. Unacceptable work shall be removed and replaced with acceptable Work as directed by the Engineer. Acceptance of Work by price reduction will not be allowed.

B. Pedestrian Curb Ramp - Truncated Dome:

1. Truncated Dome Panels - Conform to the manufacturer's recommendations for placement.
2. Truncated dome panels shall be placed (wet set) on a minimum of 6-inches concrete and prior to finishing the adjacent concrete surface of the pedestrian ramp. The joint between the panel and concrete shall be finished with 1/2-inch radius edging tool.
3. Conform to MnDOT Standard Detail Plate No. 7038A for specified truncated dome surface pattern dimensions. Refer to the Drawings for actual ramp size, shape, and slopes.
4. Multiple Truncated Dome panels shall be rectangular or radial plates of equal size and shall be joined together per the manufacturer's recommendation.
5. Joint space between truncated dome panels shall be no greater than 1/4-inch in width.
6. Radius style Truncated Dome Panels required when exceeding 5' dimension from back of curb per Detail Plate STR-7.

### 3.07 CONCRETE CURING AND PROTECTION

A. Conform to MnDOT Spec. 2521.3.E and 2521.3.E.1.a (Membrane Curing Method), except as modified herein:

1. Coat all surfaces with membrane curing compound within 30 minutes after finishing at the specified rate.
2. The membrane-curing compound must contain a fugitive dye and be applied at 2 different directions perpendicular to each other to provide a uniform solid white opaque coverage (equal to a white sheet of typing paper) on all exposed concrete surfaces.
3. A second application of membrane curing compound shall be applied 4 to 8 hours after the first application at the specified rate.
4. Protect concrete against hot weather conditions as defined in the PCA Design and Control of Concrete Mixtures as when the rate of evaporation of bleed water per hour exceeds 0.2 lb. of water per square foot per hour. A chart published by the ACI and PCA can be used to predict the bleed water rate
5. Cold weather curing, when temperatures fall below 40 degrees F during placement or within the following 24 hours, shall conform to MnDOT Spec. 2521.3.E.3.a and 2521.3.E.1.b blanket curing method, except as modified below:
  - a. If temperatures are projected to fall below 32 degrees within 24 hours of concrete placement, insulated blankets shall be using for curing.
  - b. All costs associated with blanket curing shall be incurred by the Contractor.
6. Failure to comply with these provisions will result in a price reduction for the concrete Bid Item involved in accordance with MnDOT Spec. 1503.
7. The freshly finished surface shall be protected, surfaces pitted by rain will be considered unacceptable.
8. The Contractor is responsible for protecting their work until final acceptance. Removal and replacement of any concrete section damaged by pedestrians, bicycles, automobile traffic, rain, cold weather, or other causes occurring prior to final acceptance shall be the responsibility of the Contractor.

### 3.08 HIGH EARLY CONCRETE

A. Conform to MnDOT Spec. 2461.2.F.1.b, except as modified herein:

1. High early concrete shall be designed to provide a maximum water/cementitious ratio of 0.42.
2. High early concrete shall be designed to provide a minimum flexural strength of 500 psi and a minimum compressive strength of 3,000 psi in 48 hours.

### 3.09 BACKFILLING

- A. Conform to MnDOT Spec.2521.3.G, except as modified herein:
  - 1. Backfill to protect the concrete no sooner than 72 hours after placement of the concrete.

### 3.10 FIELD QUALITY CONTROL

- A. Any sidewalk, driveway, pedestrian ramp, etc. damaged by the Contractor shall be removed and replaced by the Contractor, and will be incidental to the Project.
- B. Visual Inspection – Placement of any concrete panel with defects or damage caused during construction as noted below shall be removed and replaced by the Contractor, and will be incidental to the Project:
  - 1. Popouts exceeding 7 occurrences per square yard.
  - 2. Mortar Flaking.
  - 3. Scaling.
  - 4. Any cracking not following contraction or expansion joints.
  - 5. Shrinkage cracking.
- C. The Owner shall have an independent testing laboratory perform the following tests as a minimum. The test locations will be determined by the Engineer:
  - 1. 1 air entrainment test per day, per Project (per concrete mix).
  - 2. 1 slump test per day, per Project (per concrete mix).
  - 3. 1 set of cylinders for compression test per day, per Project (per concrete mix).

### **END OF SECTION**

**SECTION 32 16 13**  
**CONCRETE CURBS AND GUTTERS**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes:
  - 1. Cast-in-place concrete curb and gutter.
- B. Related Sections:
  - 1. Section 02 41 13 – Selective Site Demolition
  - 2. Section 32 11 23 - Aggregate Base Courses

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Concrete Curb and Gutter: Measurement shall be by the linear foot measured along the face of the curb at the gutter line for each type. Payment shall include materials, preparation, placement, finishing, curing, protection, reinforcement, and backfilling. Measurement shall not include frames/castings that are located along the face of curb.
  - 2. Remove and Replace Concrete Curb and Gutter: This Bid Item shall be used for all concrete curb and gutter removed and replaced on this Project without regard to type or size and is assumed to be all hand placed. Measurement will be per linear foot along the face of curb. Payment will include all costs, including labor, materials, and equipment necessary to complete the work, including sawcutting at the removal limits and disposal of the material per Section 02 41 13, stripping and offsite disposal of soil per Section 31 00 00, construction of new concrete curb and gutter, and patching of adjacent street.
  - 3. No separate measurement or payment for modifications at driveways, pedestrian ramps, transition sections, or B618 curb installed at catch basins and radii.
  - 4. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

1.03 REFERENCES

- A. American Society of Testing Materials (ASTM):
  - 1. C260 - Air-Entraining Admixtures for Concrete.
- B. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.):
  - 1. 1503 - Conformity with Contract Documents
  - 2. 2461 - Structural Concrete
  - 3. 2531 - Concrete Curbing
  - 4. 3101 - Portland Cement
  - 5. 3113 - Admixtures for Concrete
  - 6. 3702 - Preformed Joint Fillers
  - 7. 3754 - Membrane Curing Compound

#### 1.04 SUBMITTALS

- A. Submit MnDOT approved design mix for each concrete mix designation used. If a MnDOT approved mix design is unavailable, the Engineer will establish the job mix proportions

#### 1.05 SEQUENCING AND SCHEDULING

- A. Prime Contractor is responsible for scheduling an onsite pre-pour meeting with the Owner, Engineer, Concrete Subcontractor (if appropriate), including the Concrete Forman a minimum 24 hours prior to the pouring operations.
- B. Provide notice by 2:00 pm of the day prior to any concrete curb and placement to allow for scheduling of the following activities. Notice must include mix designation, start time of placement, plant producing concrete, and Forman onsite during placement:
  - 1. Aggregate base DCP tests (per Section 32 11 23 - Aggregate Base Courses) prior to any concrete curb being placed.
  - 2. Inspection of curbing operations by a City representative, no curbing will be allowed or accepted without inspection.
  - 3. Concrete field and plant testing if required
- C. All temporary stockpiles located within the boulevard area or other areas behind the concrete curb and gutter must be removed prior to curb placement.
- D. Concrete curb and gutter construction precedes installation of pavement.
- E. Horizontal and vertical alignment established with "stringline" and or forms for concrete curb and gutter placement shall be approved by the Engineer prior to concrete placement. Notify the Engineer a minimum of 4 hours (one half day) prior to placement of concrete to allow for review and approval of "stringline" or forms.
- F. All concrete placed after October 1 must be high early strength concrete, unless otherwise approved by City Engineer.
- G. Concrete placement will not be allowed after October 15, unless otherwise approved by City Engineer.

### **PART 2 PRODUCTS**

#### 2.01 MATERIALS

- A. Concrete to Conform to MnDOT Spec. 2461, except as modified herein:
  - 1. Portland Cement: Conform to MnDOT Spec. 3101:
    - a. Type 3 air-entraining concrete produced by using Type I Portland Cement.
  - 2. Air-Entraining Admixtures: Conform to MnDOT Spec. 3113:
    - a. Conforming to ASTM C260.
    - b. Not to be added to the concrete mixtures in the field without approval from Engineer.
  - 3. Mix Designation and Classification for Concrete Curb and Gutter:
    - a. Manual Placement Mix No. 3F52.
    - b. Slip Form Placement Mix No. 3F32.
- B. Pre-Formed Joint Filler: Conform to MnDOT Spec. 3702.

- C. Curing Compound: Conform to MnDOT Spec. 3754 Poly-Alpha Methylstyrene AMS:
  - 1. Curing compound shall contain a fugitive dye.

### **PART 3 EXECUTION**

#### **3.01 GENERAL**

- A. Concrete contractor shall have at least two people with a current ACI concrete flatwork technician or flatwork finisher certification, and at least one of them must be onsite for all concrete pours.
- B. Provide copies of batch tickets for concrete mix at the time of material delivery to the Site.
- C. Construct concrete curb and gutter at the locations and elevations indicated on the Drawings. Any concrete curb and gutter that is longer than 200 linear feet continuously, shall be placed using slip form placement.
- D. Construct the style or type of curb and gutter as shown on the Drawings.
- E. Construct intersection curb radii and transitions sections to conform to the detail on the Drawings.
- F. Construct transition sections at inlet structures to conform to the detail on the Drawings.
- G. Construct concrete curb ramp depressions to conform to the detail on the Drawings.
- H. Construct curb transitions for driveways to conform to the detail on the Drawings. Locations to be verified by Engineer at the time of construction.
- I. The completed concrete work shall give the appearance of uniformity in surface contour and texture, and shall be accurately constructed to line and grade. The required joints, edges, and flow lines shall show neat workmanship. The concrete curb shall be in full accordance with the Standard Detail Drawings. Any deviations from the Standard Detailed Drawings may be cause for removal and replacement at the Contractor's expense. No price reduction will be allowed as a means to correct the deviations.
- J. Re-tempering of the concrete which has partially hardened with or without additional materials or water is prohibited.
- K. Concrete washout locations shall conform to the requirements of the NPDES.

#### **3.02 FOUNDATION PREPARATIONS**

- A. Support on a compacted aggregate base extending 1 foot behind the back of curb:
  - 1. Conform to typical sections as shown on the Drawings.
  - 2. Conform to Section 32 11 23 and MnDOT Spec. 2211.3.D.2.c.

#### **3.03 FORMS**

- A. Conform to MnDOT Spec. 2531.3.B.

#### **3.04 JOINT CONSTRUCTION**

- A. Conform to MnDOT Spec. 2531.3.E, except as modified herein:
  - 1. Contraction joints: 10-foot intervals.

2. Transverse expansion joints:
  - a. 400' intervals
  - b. Adjacent to hand placed curb
3. Contraction joints shall be formed.

### 3.05 METAL REINFORCEMENT

- A. Conform to MnDOT Spec. 2531.3.F:
  1. Metal reinforcement not required 10' on each side of catch basins or service trenches.

### 3.06 PLACING AND FINISHING

- A. Conform to MnDOT Spec. 2531.3.C, except as modified herein:
  1. The top surface of the curb and gutter shall have a brush finish at right angles to the curb line.

### 3.07 CONCRETE CURING AND PROTECTION

- A. Conform to MnDOT Spec. 2531.G and 2531.3.G.1.a (Membrane Curing Method), except as modified herein:
  1. Coat all surfaces with membrane curing compound within 30 minutes of concrete placement unless otherwise directed by Engineer.
  2. The membrane-curing compound must be applied in 2 different directions perpendicular to each other to provide a uniform solid white opaque coverage (equal to a white sheet of typing paper) on all exposed concrete surfaces.
  3. A second application of membrane curing compound shall be applied 4 to 8 hours after the first application at the specified rate.
  4. Protect concrete against hot weather conditions as defined in the PCA Design and Control of Concrete Mixtures as when the rate of evaporation of bleed water per hour exceeds 0.2 lb. of water per square foot per hour. A chart published by the ACI and PCA can be used to predict the bleed water rate.
  5. Cold weather curing, when temperatures fall below 40 degrees during placement or within the following 24 hours, shall conform to MnDOT Spec. 2531.3.G.3.a and 2531.3.G.1.b blanket curing method or method approved by the Engineer, except as modified below:
    - a. If temperatures are projected to fall below 32 degrees within 24 hours of concrete placement, insulated blankets shall be used for curing.
    - b. All costs associated with blanket curing shall be incurred by the Contractor.
  6. Failure to comply with these provisions will result in a price reduction for the concrete curb and gutter Bid Item involved in accordance with MnDOT Spec. 1503.
  7. The freshly finished surface shall be protected. Surfaces pitted by rain will be considered unacceptable.

The Contractor is responsible for protecting their work until final acceptance. Removal and replacement of any curb section damaged by pedestrians, bicycles, automobile traffic, rain, cold weather, or other causes occurring prior to final acceptance shall be the responsibility of the Contractor.

### 3.08 BACKFILLING

- A. Conform to MnDOT Spec. 2531.3.H, except as modified herein:
  1. Initial Backfilling:
    - a. Follow the 72-hours curing period with completion within 6 days of original placement, or per applicable in Milestones per Section 00 52 10 – Agreement, Paragraph 4.02.A.1.
    - b. Must be flush with top of curb elevation.



2. Final Grading:
  - a. Following completion of private utility work by others.
3. Curb damaged during backfilling is the responsibility of the Contractor.

### 3.09 HIGH EARLY CONCRETE

- A. Conform to MnDOT Spec. 2461.2.F.2.b(2), except as modified herein:
  1. High early concrete shall be designed to provide a maximum water/cementitious ratio of 0.42.
  2. High early concrete shall be designed to provide a minimum flexural strength of 500 psi and a minimum compressive strength of 3,000 psi in 48 hours.
  3. High early concrete may be included as a separate Bid Item.
- B. Early-strength concrete shall achieve sufficient strength to be opened to traffic within three days of placement, or earlier if the compressive strength of 3000 psi is achieved. Because of the accelerated rate of hardening of early-strength concrete, the Contractor shall take such extra precautions as necessary to ensure satisfactory finishing of early strength concrete.

### 3.10 WORKMANSHIP AND FINISH

- A. Conform to MnDOT Spec. 2531.3.I, except as modified herein:
  1. Any deviation in the design curvature of concrete edges in excess of 3/8 of an inch, measured with a 10-foot straight edge, will be considered unacceptable.
  2. Acceptance of Work by price reduction will not be allowed.

### 3.11 FIELD QUALITY CONTROL

- A. Any curb damaged by the Contractor shall be removed and replaced by the Contractor, and will be incidental to the Project.
- B. Visual Inspection – Placement of any concrete panel with defects or damage caused during construction as noted below shall be removed and replaced by the Contractor, and will be incidental to the Project:
  1. Popouts exceeding 7 occurrences per square yard
  2. Mortar Flaking
  3. Scaling
  4. Any cracking not following contraction or expansion joints
  5. Shrinkage cracking
- C. The Owner shall have an independent testing laboratory perform the following minimum tests. The test locations shall be determined by the Engineer:
  1. 1 air entrainment test per day, per Project (per concrete mix).
  2. 1 slump test per day, per Project (per concrete mix).
  3. 1 set of cylinders for compression tests per day, per Project (per concrete mix):
    - a. Additional cylinders may be cast to be tested to confirm when concrete has reached maturity.

## END OF SECTION

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## **SECTION 32 17 23**

### **PAVEMENT MARKINGS**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Pavement markings for control and guidance of traffic.
- B. Related Sections:
  - 1. Section 01 33 00 - Submittal Procedures

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Lines:
    - a. Lines shall be measured by the linear foot on the basis of length actually applied, regardless of color:
      - 1) Separate measurement will be made on the basis of type and nominal width.
      - 2) Double yellow lines shall be measured to include both lines per linear feet of quantity because they are applied simultaneously.
    - b. For the paint pavement markings, the second application shall be measured the same as the first application; for example: 1,000 LF of application painted twice would be paid as 2,000 LF.
  - 2. Messages:
    - a. Messages shall be measured on the basis of each applied:
      - 1) Separate measurement will be made for each type of message.
      - 2) Separate measurement will be made for paint messages and thermoplastic messages.
  - 3. Payment of each Bid Item shall be compensation in full for all costs incidental thereto, including but not limited to surface preparation, traffic control measures, maintaining the Work, removal of temporary pavement markers, together with any other expenses incurred in completing the Work that are not specifically included for payment under the Contract Bid Items.
  - 4. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 REFERENCES**

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.):
  - 1. 3592 - Drop-On Glass Beads
  - 2. The Application Specification for Conventional Pavement Marking Materials
  - 3. 3-Minute Dry Alkyd and High Solids Latex

##### **1.04 SUBMITTALS**

- A. Submit the following consistent with Section 01 33 00:
  - 1. 1 copy of the chosen paint/epoxy lot or batch formulation.
  - 2. Pavement Marking Contractor Qualifications/Certifications.
  - 3. MnDOT Certification approvals.

## 1.05 SEQUENCING AND SCHEDULING

- A. Conform to the requirements of MnDOT Specifications except as modified herein.
- B. Complete application of pavement markings within 7 calendar days of placement of the pavement to which the markings are to be applied. See paragraph 3.02 for additional scheduling requirements for each material.
- C. Complete application of pavement markings concurrently with paving done under traffic.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Paint:
  - 1. High Solids Water Based:
    - a. Free of toxic heavy metals, including lead, mercury, and cadmium.
    - b. Track Free Time - 3 minutes or less.
    - c. Yellow Prime Pigment - Colour Index Pigment Yellow No. 65 or No. 75.
    - d. White Color - Flat white.
    - e. Yellow Color - Color No. 33538 of Federal Standard 595.
  - 2. 3-Minute Dry Alkyd:
    - a. Free of toxic heavy metals, including lead, mercury, and cadmium.
    - b. Track Free Time - 3 minutes or less.
    - c. Yellow Prime Pigment - Color Index Pigment Yellow No. 65 or No. 75.
    - d. White Color - Flat white.
    - e. Yellow Color - Color No. 33538 of Federal Standard 595.
- B. Thermoplastic Premark Pavement Marking:
  - 1. As manufactured by Ennis-Flint or approved equal.
    - a. White Lines: 125mil Premark Preformed Thermoplastic.
    - b. Arrows: Premark Preformed Thermoplastic – 8330241L (Left Turn), 8330241R (Right Turn), 8330240 (Straight), 8330142L (Combination Left-Straight), 8330142R (Combination Right-Straight).
  - 2. <http://www.ennisflintamericas.com>.
- C. Glass Beads:
  - 1. Conform to MnDOT Spec. 3592 for "Drop-On Glass Beads."

### 2.02 EQUIPMENT

- A. General:
  - 1. Vehicles used shall be deployed and equipped with traffic control devices set forth in the "Minnesota Manual on Uniform Traffic Control Devices, Field Manual."
  - 2. Shadow vehicle with truck-mounted attenuator shall be used on streets with posted speed equal to or greater than 40 m.p.h. or ADT greater than 1,500 vehicles per day.
  - 3. Equipment used for spray applications shall be capable of applying glass beads by a pressurized system at a rate of at least 25 lbs/gal.
  - 4. Capable of accumulating footage applied per gun.
  - 5. Stainless steel components in the delivery system required for water-based materials.
  - 6. The only acceptable equipment for installation of Premark Thermoplastic is an infrared heater (Street Heat SR-20 or SR-28 as manufactured by Ennis-Flint).

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. The pavement marking crew shall include at least 1 technical expert knowledgeable in each of the following areas:
  - 1. Equipment operation.
  - 2. Application techniques.
  - 3. Traffic control.
  - 4. Safety regulations.
- B. The filling of tanks, pouring of materials, or cleaning of equipment shall not be performed on unprotected pavement surfaces, unless adequate provisions are made to prevent spillage of material.
- C. Thermoplastic pavement markings installers must show proof of certification for Premark Thermoplastic installation.

### **3.02 SCHEDULE**

- A. Prime Contractor is responsible for scheduling an onsite pre-signing meeting with the Owner, Engineer, and Signing Subcontractor (if appropriate) a minimum of 24 hours prior to the installation of any signing.
- B. Permanent Paint Pavement Markings:
  - 1. Place following completion of the final bituminous wearing course or interim bituminous course:
    - a. No sooner than 24 hours after placement of bituminous.
    - b. Within 7 calendar days of completion of bituminous placement, or per manufacturer recommendations on MnDOT's approved products list.
    - c. Pavement markings on the bituminous wearing course and interim bituminous course shall be applied twice. The second application can be applied as soon as the first application has had sufficient time to dry according to manufacturer's recommendations. Temporary pavement markings only need to be applied once.
- C. Temporary Paint Pavement Markings:
  - 1. Place following completion of the final bituminous wearing course or interim bituminous course:
    - a. Temporary markings can be placed immediately after paving and allowing pavement surface to cool
    - b. Temporary pavement markings only need to be applied once.
- D. Pavement Markings Thermoplastic:
  - 1. Place following bituminous wearing course placement.
  - 2. Place all markings indicated as pavement marking thermoplastic on Drawings.

### **3.03 PREPARATION**

- A. Locations:
  - 1. In general accordance with the Drawings:
    - a. Location of marking designating no passing zones to be coordinated with corresponding traffic signs.

2. The Engineer will place necessary "Spotting" at appropriate points:
    - a. Horizontal control.
    - b. Starting and stopping points.
    - c. Broken line intervals will not be marked.
    - d. Longitudinal joints, pavement edges, and existing markings shall serve as horizontal control when so directed.
    - e. Notify Engineer at least 48 hours in advance when requesting spotting locations.
  3. Edge lines and lane lines are to be broken only at intersections with public roads and at private entrances if they are controlled by a yield sign, stop sign, or traffic signal.
  4. The break point is to be at the start of the radius for the intersection or at marked stop lines or crosswalks.
- B. Street Surface:
1. Engineer may direct cleaning of surface as necessary immediately prior to marking application:
    - a. Brushing with non-metallic rotary broom.
    - b. Other cleaning method approved by Engineer.
    - c. Air blast following cleaning.
  2. Surface must be dry.
  3. Minimum surface temperature is 50 degrees F.
- C. Traffic Control:
1. Conform to latest edition of MnDOT "Temporary Traffic Control Zone Layouts – Field Edition."
  2. Shadow vehicle with truck-mounted attenuator shall be used on streets with posted speed equal to or greater than 40 m.p.h. or ADT greater than 1,500 vehicles per day.

### 3.04 APPLICATION

- A. General:
1. Tolerance:
    - a. Width: A tolerance of 1/4 inch under or 1/4 inch over the specified width will be allowed for striping provided the variation is gradual and does not detract from the general appearance.
    - b. Length: Broken line segments may vary up to 2-3/4 inches from the specified lengths provided the over and under variations are reasonably compensatory.
    - c. Alignment: Deviations from the control guide shall not exceed 2 inches.
    - d. Establishment of application tolerances shall not relieve the Contractor of his responsibility to comply as closely as practicable with the planned dimensions.
  2. Material shall not be applied over longitudinal joints.
  3. 4-inch broken line consists of 10 feet of paint and 40 feet space (1 cycle).
  4. If same equipment used for different color material with change in color, an amount of material equal to fifteen 10-foot long stripes shall be wasted prior to beginning application with the new color.
  5. Conditions:
    - a. Markings shall not be applied when wind or other conditions cause a film of dust to be deposited on the pavement surface after cleaning and before the marking material can be applied.
    - b. Except when used as a temporary marking, pavement markings shall only be applied in seasonable weather when air temperature is 50 degrees F or higher.
- B. Paint:
1. Minimum thickness 15 mil. for permanent markings, 10 mil. for temporary markings.
  2. In accordance with the appropriate MnDOT Spec.

3. Temporary painted lines shall be applied once. Painted lines on bituminous initial lift shall be applied once.
  4. Permanent painted lines shall be applied twice. Painted lines on the bituminous final lift shall be applied twice.
  5. Interim Bituminous Course, Including Integral Bituminous Curb: All lines and messages (i.e. stop bar, cross walk, etc.) shall be applied twice.
- C. Glass Beads:
1. Shall be applied immediately after application of paint or epoxy markings.
  2. Rate of application shall be 8 lbs. per gallon.
- D. Pavement Marking Thermoplastic:
1. Apply per the manufacture's recommendations.
  2. Width of thermoplastic must match design pavement marking width. For example, 12-inch wide thermoplastic must be used for 12-inch stop bar. Two 6-inch wide strips of thermoplastic will not be allowed to be used to create a 12inch stop bar.

### 3.05 CORRECTION OF DEFECTS

- A. All pavement markings not conforming to the requirements of the Specifications shall be removed and replaced, or otherwise repaired to the satisfaction of the Engineer.
- B. Where yield computations show a deficiency in material usage of not more than 20 percent, Owner may require satisfactory repair or may accept the Work at a reduced Bid Unit Price that is in direct proportion to the percent of the deficiency.
- C. Where yield computations show a deficiency in material usage in excess of 20 percent, Owner will require removal and replacement to the satisfaction of the Engineer, unless other means are approved by the Engineer.
- D. If removal and replacement is required, at least 90 percent of the deficient line shall be removed.
- E. Width of removal shall be 1 inch wider on all sides than the nominal width of the marking to be removed.
- F. Removal of unacceptable Work shall be accomplished with sand or water blasting equipment, unless other means are authorized by the Engineer. Bituminous street surfacing shall not be damaged by the removal operation.

## END OF SECTION

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## **SECTION 32 92 00**

### **TURF AND GRASSES**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

**A. Section Includes:**

1. Restoration of construction area by installation of topsoil, topsoil/compost mixture, seed, sod, soil amendments, mulch, and erosion control.

**B. Related Sections:**

1. Section 01 33 00 - Submittal Procedures
2. Section 01 57 13 - Temporary Erosion and Sediment Control

##### **1.02 PRICE AND PAYMENT PROCEDURES**

**A. Measurement and Payment:**

1. Seeding: Measurement will be based upon pounds of seed placed as specified, according to type of seed mixture. Payment will include soil amendments, furnishing and installing seed, preparation of surface, and all incidental items associated with the work.
2. Sod, Mineral Type: Measurement will be based upon units of square yards of sod installed complete in place as specified, including soil amendments, furnishing and installing sod, preparation of surface, and all incidental items associated with the work.
3. Mulch: Measurement will be based upon units of acres, according to type, complete in place as specified. Payment will include preparation of seedbed, fertilizer, furnishing and installing mulch including disk anchoring, and all correlated activity.
4. Erosion Control Blanket: Measurement will be based upon units of square yards of area restored, according to the type of blanket installed. Payment will include all costs related to furnishing and placing fertilizer, blanket, and all correlated activity.
5. Hydraulic Matrix:
  - a. Measurement will be per acre of area restored, according to the type hydraulic matrix used. Payment will include all costs related to furnishing and placing fertilizer, hydraulic matrix, and all correlated activity.
  - b. Measurement will be per square yard of area restored, according to the type hydraulic matrix used. Payment will include all costs related to furnishing and placing fertilizer, hydraulic matrix, and all correlated activity.
6. Topsoil Borrow: Measurement will be per cubic yard (loose volume) of material hauled to the Site. Payment will include all costs related to furnishing the topsoil:
  - a. All costs related to placing, shaping, and compacting the topsoil at locations shown on the Drawings or as directed by the Engineer shall be incidental to the Boulevard Grading Bid Item. Where boulevard grading is not required, all costs are considered incidental to the various Seed or Sod Bid Items.
7. Topsoil/Compost Mixture: Measurement will be per cubic yard (loose volume) of material hauled to and placed on the Site. Payment will include all costs related to furnishing the topsoil, compost, thoroughly mixing the compost with topsoil, and placing the mixture:
  - a. All costs related to placing, shaping, and compacting the topsoil/compost mixture at locations shown on the Drawings or as directed by the Engineer shall be incidental to the Boulevard Grading Bid Item. Where boulevard grading is not required, all costs are considered incidental to the various Seeding, Sodding, or Planting Bid Items.

8. Emergency Overflow Swale Grading and Restoration, Including Seed and Erosion Control Blanket: Payment for the grading and restoration of the emergency overflow swale will be made at the Unit Price per square yard. This shall be considered full compensation for all labor, equipment, and materials associated with the work as specified, including the seed and erosion control blanket:
  - a. No separate measurement and payment for seed and erosion control blanket will be made for areas paid for as Emergency Overflow Swale.
9. Application of Water for Turf Establishment: Measurement shall be based on each 1,000 gallons (MG) of water applied to restored areas. Payment at the Unit Price shall be considered payment in full for all labor, equipment, water, and material necessary to complete the watering as directed:
  - a. Watering activity required for growth during the establishment period for seed or sod.
  - b. Additional watering after the establishment period in accepted areas as requested by Engineer.
  - c. No payment will be made for watering after the establishment period for rejected areas.
10. Furnishing and installation of items to secure required restoration materials, including staples for erosion control blanket, shall be considered included in the Bid Item for that particular material. No separate measurement or payment will be made for such items.
11. All costs related to sweeping and cleaning any pavement, driveways, trails, sidewalks, etc. that are impacted by restoration activities shall be considered incidental to the restoration Bid Items. No payment will be made under the Street Sweeper With Operator and Skidsteer (Bobcat) With Operator Bid Items for this work.
12. Measurement of restored areas shall be on the area actually covered. No additional compensation will be made for overlapping of restoration materials, such as erosion control blanket.
13. Payment for Bid Items included within this section will be made per MnDOT Spec. 2575.5.J. Partial payment of 50% of the contract unit items, with the remaining partial payment after proper maintenance and acceptance of the vegetative cover.
14. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.):
  1. 2575 – Establishing Vegetation and Controlling Erosion
  2. 2574 – Soil Preparation
  3. 3876 – Seed
  4. 3877 – Topsoil Material
  5. 3878 – Sod
  6. 3882 – Mulch
  7. 3885 – Rolled Erosion Control Products
  8. 3890 – Compost
- B. Minnesota Department of Transportation Seeding Manual 2014 (MnDOT Seeding Manual).

### 1.04 SUBMITTALS

- A. Provide the following submittals consistent with Section 01 33 00:
  1. Provide source and invoice for seed to be used for this Project.
  2. Producer's certificate of compliance – Written documentation verifying compliance of mixture of seed furnished. Include percentage of various seed species, year of production, germination

rate, seed bag tags, and weed seed content. Submit to the Engineer at least 5 days prior to delivery.

3. Species within native seed mixes species shall have their origin documented by the Minnesota Crop Improvement Association (MCIA) to certify that the product is a local ecotype plant.
4. Notify the Engineer 30 days prior to placement topsoil/compost mixture to allow for inspection, sampling, and testing if necessary.
5. Provide documentation for tests of the topsoil and compost separately, and submit this information at the pre-construction meeting.
6. Topsoil material requirements per MnDOT Spec 3877.3.
7. Compost material requirements per MnDOT Spec 3890.3.

B. Provide Engineer with seed bag tags used for identification purposes.

#### 1.05 PLANT ESTABLISHMENT PERIOD

- A. The Establishment Period for plants shall begin for immediately after installation, with the approval of the Engineer, and continue until the date that the Engineer performs a final inspection:
1. The establishment period for sod is 30 days.
  2. The establishment period for seeded areas is 45 days.
  3. The germination period for seed is 14 days.

#### 1.06 SEQUENCING AND SCHEDULING

- A. Begin final restoration within 7 calendar days of the bituminous initial lift paving or interim bituminous course paving and demonstrate continuous progress until completed, or per applicable Milestones per Section 00 52 10 – Agreement, Paragraph 4.02.A.1.
- B. Roadway Rehabilitation projects, begin final restoration within 5 calendar days of the bituminous initial lift paving and demonstrate continuous progress until completed, or per applicable Milestones per Section 00 52 10 – Agreement, Paragraph 4.02.A.1.

### **PART 2 PRODUCTS**

2.01 TOPSOIL: Topsoil Borrow Conforming to MnDOT Spec. 3877.2.B.

2.02 FERTILIZER: Conform to MnDOT Spec. 3881.2.B.3, TYPE 3.

- A. Provide plant fertilizer that is commercial grade and uniform in composition and conforms to applicable state and federal regulations.
- B. Slow release fertilizer. A minimum of 70 percent of the nitrogen component shall be a slow-release water insoluble nitrogen.
- C. Fertilizer shall contain a minimum percentage by weight 10-10-10 (NKP).

2.03 SOD: Conform to MnDOT Spec. 3878.2.D, Mineral Sod.

2.04 SEED: Conform to MnDOT Spec. 3876:

- A. Lawns: MnDOT Mixture 25-151.
- B. General Roadside: MnDOT Mixture 25-141.

- C. Temporary Spring Cover: MnDOT Mixture 21-111.
  - D. Temporary Fall Cover: MnDOT Mixture 21-112.
  - E. Temporary Mix: MnDOT Mixture 21-113.
  - F. Pond Edge Mix: MnDOT Mixture 33-261.
- 2.05 MULCH: Conform to MnDOT Spec 3882:
- A. Type 1, clean grain straw unless identified otherwise.
  - B. Hydraulic erosion control products may be used in lieu of mulch with the approval of the Engineer.
- 2.06 HYDRAULIC EROSION CONTROL PRODUCTS (HECPs): CONFORM TO MNDOT SPEC. 3884
- A. Hydraulic Matrix: Conform to MnDOT Spec 3884.2.B
- 2.07 ROLLED EROSION CONTROL PRODUCTS; CONFORM TO MNDOT SPEC. 3885
- A. Erosion Control Blanket, Category 3N, Straw unless identified otherwise.
  - B. Turf Reinforcement Mat, Category 1 unless identified otherwise.
- 2.08 EROSION STABILIZATION MAT: Conform to MnDOT Spec. 3888.
- 2.09 COMPOST: Conform to MnDOT Spec. 3890.2.B, Grade 2 Compost.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Review restoration areas with the Engineer. Determine locations for seed or sod. Schedule for restoration of areas may be revised to fit field conditions:
  - 1. No compensation will be allowed for areas considered to be needlessly restored if restoration activities are performed without the authorization of the Engineer.
- B. Notify the Engineer at least 3 days in advance of hauling topsoil borrow on Site so the Engineer may visually inspect and sample for testing if deemed necessary.
- C. Finish grades are to be inspected and approved by the Engineer prior to start of restoration.

#### **3.02 DELIVERY AND STORAGE**

- A. Delivery:
  - 1. Notify the Engineer of the delivery schedule in advance so the plant material may be inspected upon arrival at the Site. Remove unacceptable plant material from the Site immediately.
  - 2. Deliver fertilizer and lime to the Site in the original, unopened containers bearing the manufacturer's guaranteed chemical analysis, name, trade name or trademark, and in conformance to state and federal law. In lieu of containers, fertilizer and lime may be furnished in bulk and a certificate indicating the above information shall accompany each delivery.
  - 3. During Delivery: Protect sod from drying out and seed from contamination.

- B. Storage:
  - 1. Sprinkle sod with water and cover with moist burlap, straw, or other approved covering, and protect from exposure to wind and direct sunlight. Covering should permit air circulation to alleviate heat development.
  - 2. Keep seed, lime, and fertilizer in dry storage away from contaminants.

### 3.03 PREPARATION

- A. General: Conform to MnDOT Spec. 2575.3.A.
- B. Soil Preparation: Conform to MnDOT Spec. 2574.
- C. Fertilizers and Conditioners: Conform to MnDOT Spec. 3881 and 3879:
  - 1. Apply fertilizer at a rate of 400 lbs. per acre (9.2 lbs./1,000 sq. ft.).
  - 2. Where soil pH is lower than 5.5, apply lime at 3 tons per acre (140 lbs./1,000 sq. ft.).

### 3.04 TOPSOIL/COMPOST MIX

- A. Subgrade to be inspected and approved by Engineer prior to placement of topsoil/compost mix.
- B. Construct mix by thoroughly blending topsoil and compost at 70 percent/30 percent ratio:
  - 1. Off site blending of topsoil and compost is required
  - 2. The blended materials shall be screened to 1" size.
- C. 6-inch minimum compacted thickness.

### 3.05 SOWING SEED

- A. Seeding Preparation and Application: Conform to MnDOT Spec. 2574 and 2575.3.B for the mixes specified.
- B. Prior to placing hydraulic erosion control products (hydraulic matrix):
  - 1. Install seed prior to hydraulic matrix installation using a "brilliant type" seeder to evenly spread seed over the entire Site.
  - 2. The Site shall be harrowed or raked parallel to the slope contours following seeding.
  - 3. The Site shall be packed using a culti-packer or equivalent, following harrowing.
  - 4. Application of fertilizer.

### 3.06 PLACING SOD

- A. Conform to MnDOT Spec. 2575.3.F.
- B. Place, shape, and compact 4 inches of topsoil or 6 inches of topsoil/compost mix, as appropriate, prior to placement of sod.

### 3.07 MULCH: Conform to Section 01 57 13.

### 3.08 EROSION CONTROL BLANKET

- A. Erosion control blanket shall be installed immediately following seeding in accordance with MnDOT Spec. 2575.3.G.2, and as modified below.
- B. Raking or harrowing of soil/seed shall be done before installation of erosion control blanket.

- C. Install blanket parallel to the direction of flow in all cases.
- D. If permanent seeding is not available at the time of blanket installation, this material will have to be removed, re-seeded, and installed again as a permanent erosion control measure. If permanent seeding is available at the time of initial installation, a 1-time proper installation is acceptable.

### 3.09 HYDRAULIC EROSION CONTROL PRODUCTS

- A. Hydraulic Matrix:
  - 1. Apply in conformance with MnDOT Spec. 2575.3.E.
  - 2. Raking or harrowing of soil/seed and slope (cat) tracking shall be done before installation of hydraulic matrix.
  - 3. Apply hydraulic matrix in at least 2 opposing directions so that a shadowing effect leaving the back side of a soil clod unprotected is minimized.
  - 4. Application Rate:
    - a. Slopes steeper than 1:4: Apply at a rate of 2,800 lbs per acre. Two applications may be necessary.
    - b. All other slopes: apply at a rate of 2,100 lbs per acre.
  - 5. Apply hydraulic matrix immediately following seeding.

### 3.10 EMERGENCY OVERFLOW SWALE

- A. Construct emergency overflow swales at locations shown on the Drawings.
- B. Grade the overflows as staked and directed.
- C. Upon approval of the grading, place topsoil, seed, and erosion control blanket.
- D. Re-establish the emergency overflow swale as part of the final Site clean-up and restoration.

### 3.11 SWEEPING AND CLEANUP

- A. Immediately following the topsoil, seed and sod placement, sweep and clean all pavement, driveways, trails and sidewalks impacted these operations:
  - 1. Final clean up of the bituminous surface with the use of a power pickup broom and front end loader/skidsteer.
  - 2. Street sweeping operations must include the application of water to effectively remove fine materials from pavement areas. The appropriate amount of water shall be applied, eliminating dust as part of the sweeping operations.
  - 3. Respond within 24 hours of a request by the Engineer, with the necessary street sweeping equipment to perform the cleanup operations.

### 3.12 MAINTENANCE, CONFORM TO MNDOT SPEC. 2575.3, OR AS MODIFIED HEREIN:

- A. Restored areas that have been satisfactorily completed and are disturbed by additional construction activity required by the timing and sequencing of the Work shall be restored over to the same requirements of the original work.
- B. Any sod that does not show definite growth and establishment 30 days after installation shall be replaced and established at the proper season by the Contractor at his/her expense.
- C. Seed maintenance shall be done in conformance with the MnDOT Seeding Manual – With the following exception: Water the seeded areas to ensure establishment:

1. Compensation will be made for all watering activity during the initial 45-day maintenance period for seed, per Bid Item for Application of Water for Turf Establishment.
  2. At the end of the 45-day maintenance period, Engineer will make an inspection of all restored areas. Engineer may direct Contractor to continue watering of any area if deemed necessary. Frequency of watering shall be as directed and modified by the Engineer. Duration of watering shall continue at the directed frequency until Contractor is directed by Engineer to cease.
- D. Weed control shall be the responsibility of the contractor during the initial 45-day establishment period. Weed control may include spot spraying and mowing to control weed growth.
- E. Seeded areas that do not show seed germination 14 days after installation shall be replaced at the proper season by the Contractor at his/her expense and watering will be required every day at a minimum.
- F. Seeded areas that do not show definite growth and establishment 45 days after installation shall be replaced and established at the proper season by the Contractor at his/her expense.
- G. Watering of sod areas shall be done for a minimum period of 30 days from installation sufficient to ensure establishment of permanent vegetation:
1. At the end of the 30-day maintenance period, Engineer will make an inspection of all restored areas. Engineer may direct Contractor to continue watering of any area if deemed necessary. Frequency of watering shall be as directed and modified by the Engineer. Duration of watering shall continue at the directed frequency until Contractor is directed by Engineer to cease.

### 3.13 FIELD QUALITY CONTROL

- A. TOPSOIL BORROW:
1. Source testing:
    - a. The Contractor shall split and test a sample from prospective source with the Owner prior to the preconstruction meeting.
    - b. The Contractor's QC sample and Owner's QA sample shall meet the requirements of section 2.01A. If the requirements are not met the Contractor must provide material from another source.
  2. Placement testing:
    - a. The Contractor shall split and test a sample onsite at the time of placement with the Owner.
    - b. The Contractor's QC sample and Owner's QA sample shall meet the requirements of section 2.01A. If the requirements are not met the material will be rejected. The Contractor is responsible for all costs associated with additional testing due to failing materials.

### 3.14 INSPECTION AND ACCEPTANCE

- A. Seeding and turf work will be inspected for acceptance in parts agreeable to the Engineer, provided Work offered for inspection is complete, including maintenance for the portion in question.
- B. Seeded areas will be inspected for germination and growth 14 days after placement. Any restored areas that do not show definite germination and growth, as determined by the Engineer, shall be replaced and re-established by the Contractor at his/her expense.

- C. At the conclusion of the establishment period(s), a final inspection of planting(s) will be made to determine the conditions of areas specified for landscaping.
- D. When inspected landscape work does not comply with requirements, replace rejected Work and continue specified maintenance until re-inspected by Engineer and found to be acceptable. Remove rejected materials from the Site.
- E. Seed evaluation at the conclusion of the establishment period related to acceptance, shall be based on at least 1 species per square foot with 90 percent of seeding per square foot being of the permanent seed species within the applied mix.
- F. Boulevard settlements that occur during the correction period and are greater than 1 inch as measured by a 10-foot straight edge will be repaired in a manner acceptable to the Owner at the Contractor's expense.

**END OF SECTION**



**SECTION 32 93 00**  
**TREES, SHRUBS, PERENNIALS**

**PART 1 GENERAL**

**1.01 SUMMARY**

**A. Section Includes:**

1. This section covers the furnishing of all labor, materials, tools, equipment and performance of all work and services necessary or incidental to plant installation as indicated on the drawings or as specified herein.

**B. Related Sections:**

1. American National Standards Institute (ANSI)
  - a. ANSI Z60.1 – American Standard for Nursery Stock.
2. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

**1.02 PRICE AND PAYMENT PROCEDURES:**

**A. Measurement and Payment:**

1. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:
  - a. Deciduous Trees: Measurement will be by each tree species, variety, and caliper and/or size range furnished and planted in accordance with the Drawings. Payment shall include:
    - 1) Excavation for tree planting hole.
    - 2) Furnishing and Planting of tree.
    - 3) Furnishing and installing accessories.
    - 4) Maintenance and watering, including furnishing and installing slow release watering bag.
  - b. Shrubs: Measurement will be by each shrub species, variety, and size range furnished and planted in accordance with the Drawings. Payment shall include:
    - 1) Excavation for planting hole.
    - 2) Furnishing and Planting of shrub.
    - 3) Furnishing and placing mulch.
  - c. Perennials: Measurement will be by each perennial species, variety, and size range furnished and planted in accordance with the Drawings. Payment shall include:
    - 1) Excavation for planting hole.
    - 2) Furnishing and Planting of perennial.
    - 3) Furnishing and placing mulch.
  - d. Transplant Tree: Measurement will be per each tree, regardless of size or type. Payment will include salvaging the tree, temporarily storing the tree during construction, and re-planting the tree as specified in the same general location and as directed by the Engineer.
2. All other work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 (MnDOT Spec.):
  - 1. 2571 – Plant Installation and Establishment

## **PART 2 PRODUCTS**

### 2.01 MATERIALS

- A. Nursery Stock:
  - 1. Plant materials shall conform to the requirements of Mn/DOT Specification 3861 and ANZ60.1.
  - 2. No substitutions will be accepted without written approval from the Owner or Engineer.
  - 3. Treated burlap will be allowed on soil balls, as an exception to Mn/DOT Specification 2571.3F, and 3861.2.G, if vertical slits are cut through the burlap. The vertical slits shall be made at six (6) inch intervals horizontally around the circumference of the root ball and shall be made from the top of the root ball extending downward and shall be done in a manner which does not damage the root system.
- B. Fertilizer: Conform to MnDOT Spec. 3881.2.B.3, Type 3 – Slow Release Fertilizer.
- C. Mulch: Conform to MnDOT Spec. 3882, or as modified below:
  - 1. Shredded hardwood mulch shall be provided free of dirt, ashes, sawdust, rocks, leaves, roots, black bark mold or any other debris.
- D. Soil moisture Amendment Pellets: Soil Moist Professional Granular by JRM Chemical, Inc. or approved equal.
- E. Slow Release Watering Bag: Treegator® Original or approved equal.

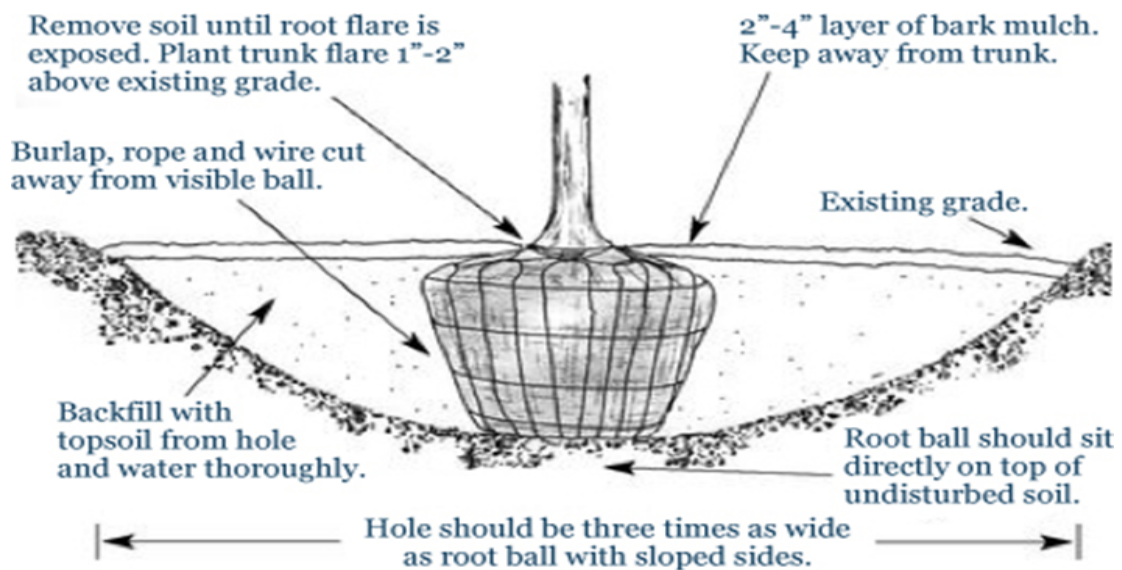
## **PART 3 EXECUTION**

### 3.01 CONSTRUCTION REQUIREMENTS

- A. Planting operations shall not be started, nor shall any planting stock be delivered to the Project site, until all other work has been completed in the area of the proposed planting site as determined by the Engineer.
- B. Notify the Engineer orally or in writing, as designated by the Engineer, at least twenty four (24) hours prior to the start of any planting operations during this Contract, including layout staking, clearing, weed spraying, soil preparation, watering, mulching, plant protection, weeding and clean-up.
- C. All planting operations shall be performed during normal working hours and under conditions suitable for such work, as determined by the Engineer, unless otherwise authorized by the Engineer.
- D. The Engineer and City Parks Department will field stake the location of trees to be planted. All other plantings shall be staked by the contractor then reviewed and accepted by the City prior to installation.
- E. Establish final grade prior to planting trees.

F. Balled and Burlapped Tree Planting:

1. Construct planting hole to be 3 times as wide as the diameter of the root ball.
2. Construct planting hole to be deep enough so the root flare is 1"-2" above finished grade.
3. Scarify the sides of the planting hole to avoid glazing.
4. Remove any excess soil to expose the root flare after placing the tree in the planting hole and adjust the depth as necessary to keep root flare 1"-2" above finished grade.
5. Remove a minimum 2/3 of the wire basket and as much burlap as possible from the root ball.
6. Remove all twine from the root ball.
7. Backfill with soil from the original planting hole, tamping every few inches while backfilling. Keep the root flare exposed.
8. Taper the outside edges of the backfill slightly below the original grade to help retain water.



G. Container Grown Trees:

1. Construct planting hole to be 3 times as wide as the diameter of the root ball.
2. Construct planting hole to be deep enough so the root flare is 1"-2" above finished grade.
3. Scarify the sides of the planting hole to avoid glazing.
4. Remove the container from the root ball.
5. If the tree is heavily pot bound, use the box cut method to reduce the chance of girdling roots. Using a pruning saw, cut 1"-3" off the roots on 4 sides, leaving a square or box to be planted.
6. Remove any excess soil to expose the root flare after placing the tree in the planting hole and adjust the depth as necessary to keep root flare 1"-2" above finished grade.
7. Backfill with soil from the original planting hole, tamping every few inches while backfilling. Keep the root flare exposed.
8. Taper the outside edges of the backfill slightly below the original grade to help retain water.

H. Mulching:

1. Place a layer of mulch 2"-4" thick extending 1"-2" past the outside of the planting hole.
2. Leave 2"-3" of space between the root flare and mulch.
3. The outside boundary of the mulch ring should be raised slightly to help retain water.

- I. Staking:
  1. Staked only as needed and directed by the Engineer.
  2. Stake when the root ball moves easily while the top of the tree is being moved back and forth or when the top cannot support itself and is bending.
  3. Materials directly connecting to the tree should have a broad smooth surface.
  4. Place stakes 6" inside the mulched area directly across from each other.
  5. Wire or rope used to connect the stake to the tree should be loose enough to allow the tree to move slightly in all directions.
  6. Stake the tree as low as possible, but not higher than 2/3 the height of the tree.
- J. Soil Moisture Amendment:
  1. Apply per manufacturer's recommendations.
  2. This item shall be considered incidental to the respective planting.
- K. Shrub and Perennial Planting:
  1. Excavate planting hole to a width of 2 times the container size.
  2. Excavate planting hole to the depth of the container.
  3. Furnish and install specified plant.
  4. Backfill with soil from the original planting hole. Respread any excess excavated material.
  5. Place mulch 3" thick, unless otherwise specified on the drawings.
- L. The Plant Establishment Period shall be 2 years, and shall begin upon written approval of the work by the Engineer. Replacement of dead or defective trees or incidental materials shall be required immediately or as soon as is practicable within an appropriate period of time as ordered by the Owner or Engineer. It is anticipated that the plant establishment will be included in the specified warranty period and that no retainage will be held throughout the plant establishment period unless the Owner or Engineer determine that the materials or procedures warrant such a retainage.
- M. Watering during the Plant Establishment Period shall consist of maintaining adequate (but not excessive) soil moisture at all times. Each tree planted shall have a slow release watering bag furnished and installed per manufacturer's recommendation in addition to the watering requirements. It is recommended that after the initial thorough "watering in", every tree should receive a thorough watering, as necessary, at weekly intervals, on the average, throughout the growing season (approximately May 1 thru October 1). Avoid over watering all trees. **GENERAL** water guidelines for the average condition are as follows:

<u>Plant Type</u>	<u>Average Amount of Water Per Application</u>
Machine Transplanted Trees (3" caliper plus)	50 to 100 Gallons
Balled & Burlapped Trees	20 Gallons ±
Bare Root Trees	15 Gallons ±
Balled & Burlapped Shrubs	10 Gallons ±
Bare Root or Container Shrubs	7 Gallons ±

### 3.02 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Remove excess and waste materials, including unacceptable excavated material, trash, and debris from the job site.

### END OF SECTION

## **SECTION 33 05 05**

### **TRENCHING AND BACKFILLING**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

**A. Section Includes:**

1. Trenching requirements for underground piping and appurtenances, including requirements for excavation, backfill, and compaction.

**B. Related Sections:**

1. Section 01 33 00 - Submittal Procedures

##### **1.02 PRICE AND PAYMENT PROCEDURES**

**A. Measurement and Payment:**

1. Trench Excavation: Excavation and backfilling of trench and associated excavation for pipe bedding shall be included in the price of pipe provided.
2. Pipe Bedding for PVC and Corrugated Polypropylene Pipe (PP): All costs associated with providing the bedding material as shown on the Drawings and Standard Detail Plate No. BED-1 shall be considered incidental to the pipe material.
3. Rock Excavation: Measured from the top of the rock to a point 12 inches below the outside barrel of pipe and 12 inches from each side of outside diameter of pipe (at bell). The minimum trench width of Rock Excavation shall be 48 inches. For measurement purposes, volume will be computed based on vertical walls for the width specified above. Payment for Rock Excavation shall be at the Unit Price per cubic yard. Any additional Rock Excavation required for shelving or OSHA Standards will not be measured for payment and will be considered incidental to the Rock Excavation Bid Item:
  - a. The estimated quantity of Rock Excavation shown in the various parts of the Bid Form were calculated as described above, based on the top of rock elevations determined by either soil borings and/or test hole excavations. No guarantee is made as to the actual quantity of Rock Excavation that will be encountered in this Project. No variation from the Unit Price for Rock Excavation will be considered or allowed due to quantity variation.
  - b. Separate Bid Items have been provided for Rock Excavation – Soft Rock and Hard Rock. Payment will be made based on the method of rock excavation actually used in the field. Any excavation performed with a standard backhoe bucket will not be considered rock excavation.
4. Haul Excess Rock Off Site (LV): Measurement will be by the cubic yard of material hauled off site, based on a truck count. Payment will include all costs related to hauling and disposing of the material off the Site:
  - a. Any excess rock hauled off site must be approved by Engineer prior to removing.
5. Sand Cushion: Measurement shall be by the units of linear feet. Payment at the Unit Price shall include all costs related to providing the material as shown on the Drawings and Standard Detail Plate.
6. Granular Borrow: Measurement shall be by the ton of material compacted in place as determined from weight tickets delivered to the Engineer and shall include all costs related to providing the material as shown on the Drawings and Standard Detail Plate.
7. Improved Pipe Foundation: Measurement shall be by the linear foot for each 6-inch layer placed below pipe bedding, not including the first 6 inches:

- a. For example, if 2 feet of foundation material is required under a pipe; 6 inches of material is required for bedding, and payment will be made for 3 linear feet of pipe foundation material, 6 inches deep, per foot of pipe installed.
  - b. No payment will be made without the knowledge or consent of the Engineer.
  - c. No payment will be made for subgrade rock installed for de-watering purposes only, unless specified.
  - d. No payment will be made for disposing of excavated material off the Site that has been created by placement of improved pipe foundation.
- 8. Temporary Bracing and Sheeting: Considered part of the excavation costs with no additional compensation to Contractor, unless provided for otherwise.
- 9. Density Tests:
  - a. Passing Tests: All costs paid by Owner.
  - b. Failing Tests: All costs charged to and paid by the Contractor.
- 10. Dewatering: No explicit, direct payment is made for this work. Include the costs in the Unit Prices for the pipe or structure installed.
- 11. Excavation Special (Pothole Existing Private Utility): This Bid Item is for potholing and exposing existing private utilities that may be in conflict with the proposed public utilities. Measurement will be per each location exposed regardless of the number of utilities in the respective location. Payment will include all cost related to exposing the potential conflict:
  - a. The quantity shown on the Bid Form is an estimated amount. Payment will be based on the quantity actually used, regardless of the estimated quantity. No revision to the Contract Unit Price shall be considered or allowed due to variations of the actual quantity from the estimated amount.
- 12. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 (MnDOT Spec.):
  - 1. 2105 - Excavation and Embankment.
  - 2. 3149 - Granular Material.
  - 3. 1711 – Use of Explosives
- B. American Society of Testing Materials (ASTM):
  - 1. A798 -Standard Practice for Installing Factory-Made Corrugated Steel Pipe for Sewers and Other Applications.
  - 2. D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- C. American Water Works Association (AWWA):
  - 1. C150 - Thickness Design of Ductile-Iron Pipe.
  - 2. C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast for Water.

### 1.04 SUBMITTALS

- A. Provide the following submittals consistent with Section 01 33 00:
  - 1. Product Data for each Borrow Material:
    - a. Name and location of source.
    - b. Results of gradation tests.

## 1.05 DEFINITIONS

- A. Bedding: The soil material adjacent to the pipe which makes contact with the pipe foundation, walls of the trench, and upper level of backfill. The purpose of bedding is to secure the pipe to true line and grade, and to provide structural support to the pipe barrel.
- B. Foundation: Soil material beneath the pipe bedding.
- C. Improved Pipe Foundation: Foundation provided by importing material from sources outside the Site. Required when foundation is soft or unstable.
- D. Course Filter Aggregate: Free draining mineral product used around draitile pipe.
- E. Rock Excavation (Hard Rock): Includes such rocks that are **not** decomposed, weathered, or shattered, and which will require blasting, hydro-hammering, barring, wedging, or use of air tools for removal. Also included are any boulders, concrete, or masonry structure (except concrete pavement, curb and gutter, and sidewalk) exceeding 1 cubic yard.
- F. Rock Excavation (Soft Rock): Includes such rocks that are decomposed, weathered, or shattered, and which will require the use of ripping equipment, such as rock buckets and ripper hooks.
- G. Pipe Zone: That part of the trench below a distance of 1 foot above the top of the pipe.
- H. Sand Cushion: Aggregate bedding material used around pipe in areas where rock excavation is encountered, where pipe insulation is used, and when crossing existing utilities.
- I. Granular Borrow: Includes the area below the subgrade and above the pipe zone when shallow pipe is installed in areas of rock excavation.

## 1.06 SEQUENCING AND SCHEDULING

- A. Known existing underground utilities are shown on the Drawings in a general way. Owner does not guarantee the locations as shown on the Drawings. Anticipate variations in both the vertical and horizontal locations of underground utility lines from those shown on the Drawings.
- B. Uncover utilities and verify both horizontal and vertical alignments sufficiently in advance of construction to permit adjustments in the Work. Determine location of existing utilities and identify conflicts before excavating trench for pipe installation.
- C. Notify Gopher State One Call before starting construction in a given area, requesting utility locations in the field.
- D. Provide continuance of flow of existing sewer and other facilities.
- E. Backfill and compact all trench excavations promptly after the pipe is laid.
- F. Salvage and re-spread existing topsoil within trench and spoil pile areas. This work shall be considered incidental to the pipe installation.

## 1.07 WARRANTY

- A. Trench settlements that occur during the correction period and are greater than 1/2 inch as measured by a 10-foot straight edge will be repaired in a manner acceptable to the Owner at the Contractor's expense.

## PART 2 PRODUCTS

### 2.01 PIPE BEDDING MATERIAL

- A. Polyvinyl Chloride (PVC) Pipe, Corrugated Polypropylene Pipe (PP), and High Density Polyethylene (HDPE) Pipe:
  - 1. Comply with MnDOT Spec. 3149.2.B.1 for granular borrow, modified with the following:
    - a. No existing onsite granular material encountered during construction may be used unless approved by Engineer, based on quality control gradations provided by the Contractor for the onsite material being placed. The rate of testing will be determined based on changes of the existing material, or as determined by Engineer.
    - b. 1 inch maximum aggregate size.
    - c. Only virgin materials allowed.
- B. Ductile Iron Pipe (DIP) and Reinforced Concrete Pipe (RCP):
  - 1. Installation Type 3 or as identified on the drawings.

### 2.02 IMPROVED PIPE FOUNDATION MATERIAL

- A. Comply with MnDOT Spec. 3149.2H Modified:
  - 1. Crushing Requirements: At least 50 percent of the material by weight retained on the No. 4 sieve shall have 1 or more crushed faces.

### 2.03 SAND CUSHION MATERIAL

- A. Comply with MnDOT Spec. 3149.2.B.1 for Granular Borrow, modified with the following:
  - 1. No existing onsite granular material encountered during construction may be used unless approved by Engineer, based on quality control gradations provided by the Contractor for the onsite material being placed. The rate of testing will be determined based on changes of the existing material, or as determined by Engineer.
  - 2. 1 inch maximum aggregate size.
  - 3. Only virgin materials allowed.

### 2.04 BACKFILL MATERIAL

- A. Suitable materials selected from the excavated materials to the extent available and practical.
- B. Suitable materials are mineral soils free of rubbish, trees, stumps, branches, debris, frozen soil, oversize stone (greater than 1 cubic foot), concrete and bituminous chunks, and other similar unsuitable material.
- C. When suitable materials are not available, as determined by the Engineer, comply with MnDOT Spec. 3149.2.B.1 for Granular Borrow.



## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Prior to construction, inspect existing utility structures and surface features, and document condition.
- B. Re-inspect foundation soils if rain fall or snow has occurred after initial inspection but prior to placing pipe and bedding.
- C. Prior to construction, perform the Excavation Special (Pothole Existing Utility) for the purpose of determining possible conflicts between existing private utilities and proposed public utilities. Allow sufficient time for private utility companies to relocate facilities or Engineer to redesign public utilities.

### **3.02 PREPARATION**

- A. Notify Utility Owners to field mark their utility locations.
- B. Protect as necessary surface features, such as utility poles, trees, structures, pavement, etc., that are not designated on the Drawings to be removed.
- C. Notify utility companies of progress schedule so they can accomplish any necessary relocations and removals that they have agreed to relocate, remove, or support.
- D. Implement traffic control.
- E. Complete temporary removal or relocation of surface features, such as fences, shrubs, signs, and mailboxes.
- F. Strip off existing topsoil from within the trench excavation limits and stockpile. Separate vegetative strippings from salvageable topsoil and dispose of appropriately.
- G. Crossing Under Existing Utility Lines:
  - 1. Use extreme care when excavating in the vicinity of underground utility lines to avoid damage to protective coatings or surfaces.
  - 2. Where possible and as authorized by the utility, temporarily remove the utility line, install the new pipe, and reinstall the utility line.
  - 3. Where existing line cannot be removed or is not feasible to remove, securely support, excavate under, backfill under and around the utility line to 100-Percent Standard Proctor Density.
  - 4. Report and repair damaged lines prior to backfilling trench.
- H. Rock Excavation:
  - 1. Contractor shall submit a blasting plan for review and approval by the Engineer.
  - 2. Use of explosives comply with MnDOT Spec. 1711.

### **3.03 CONSTRUCTION**

- A. Conform to ASTM D2321 and C1479, or modified herein.

B. Trench Excavation:

1. Excavate trench to alignment and grade shown on the Drawings.
2. The trench width at the surface may vary and depends on the depth of trench and nature of the excavated material encountered. However, it shall be of ample width to permit the pipe to be laid and jointed properly and the backfill to be placed and compacted properly.
3. Correct any part of the trench that is inadvertently excavated below grade with approved material compacted to 100-Percent Standard Proctor Density.
4. Brace, shore, or sheet trench and provide drainage. Comply with applicable State Regulations relating to industrial safety to a safe angle of repose. Angle of repose may be no less than that required by the Accident Prevention Division of the State Industrial Commission or the requirements of the Occupational Safety and Health Act (OSHA), whichever is most restrictive.
5. Pile all excavated material in a manner that will not endanger the Work or obstruct sidewalks, driveways, gutters, etc.
6. Segregate soils in the excavated material that are not suitable for trench backfill and dispose of in a manner that is consistent with the requirements specified herein under "Backfill Above Pipe Zone."
7. Dispose of excess excavated materials off of right-of-ways and easements in a suitable site selected by the Contractor.
8. Haul materials, other than natural soil materials that are suitable as backfill material, to an approved landfill as directed by the Engineer.
9. It is anticipated that private utility crossings will be encountered and may interfere with the proposed public utilities.
  - a. Pothole and expose existing private utility crossings to determine location and elevation.
  - b. Perform construction activities in the vicinity of the private utilities so as not to disturb the existing crossings.
10. If frost thickness exceeds 6 inches, all frost chunks must be removed from the Site and non-frozen material must be used to backfill the excavation.

C. Water Control:

1. Dewater the ground as necessary to excavate the trench and install the pipe. All pipe and structures shall be laid in a dry condition prior to backfill. Maintain groundwater level a minimum of 1 foot below the pipe invert. Measure the rate of flow from dewatering pumps at the beginning of the dewatering operation(s) and once per week thereafter. Keep a daily log of hours pumped.

D. Trench Bottom:

1. Excavate to a sufficient depth to insure adequate foundation when the bottom of the trench is soft or where in the opinion of the Engineer unsatisfactory foundation conditions exist. Bring excavation up to pipe grade with thoroughly compacted granular materials meeting the requirements of Improved Pipe Foundation Material.
2. Provide temporary support, remove, relocate, or reconstruct existing utilities located within the trench excavation. Utility shall designate method employed. Use particular care and provide compacted fill or other stable support for utility crossings to prevent detrimental displacement, rupture, or failure.
3. Excavate to expose existing utilities that cross in close proximity to the planned pipe line to determine the utilities' exact location sufficiently ahead of pipe installation to plan for the avoidance of grade conflict. Measure to determine the utilities' location relative to the planned pipe line location. A deviation from the alignment, grade, and location to avoid conflict may be ordered by the Engineer.
4. In locations where rock affects the pipe foundation, excavate the trench 12 inches below the pipe and place sand cushion material up to the top of the pipe zone. Blend suitable on Site backfill material with any rock (1 cubic foot maximum size) that is placed back in trench. Dispose of excess rock at a suitable location outside the Site:

- a. Sand Cushion: The removal and disposal of the unsuitable material within the trench and below the invert elevation, and the replacement up to invert elevation with the appropriate bedding material.
  - b. Granular Borrow: The removal and disposal of unsuitable material within the trench, above the pipe zone, and replacement up to the subgrade with appropriate backfill material, per Detail BED-4. No additional compensation will be allowed for wider or deeper trenches in rock excavations.
  - c. For PVC, Corrugated PP, and HDPE Pipe, the sand cushion shall be placed to 1 foot above the pipe and shall be paid as pipe bedding. The remainder of the trench up to the top of the rock shall be backfilled with granular backfill material.
5. Improved Pipe Foundation: When unsatisfactory foundation conditions exist, excavate to a depth consisting of solid materials. Fill to pipe grade with thoroughly compacted granular materials meeting the requirements of Improved Pipe Foundation Material.

### 3.04 PIPE BEDDING

- A. PVC Pipe and Corrugated PP: Bed pipe in accordance with ASTM D2321 and Standard Detail Plate BED-1.
- B. RCP: Bed pipe in accordance with ASTM C1479 and Standard Detail Plate BED-2
- C. DIP: Bed pipe in accordance with AWWA Standard C150 and C151 and Standard Detail Plate BED-2
- D. HDPE Pipe: Bed pipe in accordance with ASTM D2321 and Standard Detail Plate BED-1.
- E. Corrugated Metal Pipe: Bed pipe in accordance with ASTM A798 and Standard Detail Plate BED-2.
- F. The trench directly under the pipe shall be loosely placed un-compacted material per the Standard Detail Plates.
- G. Use only selected materials free from rock, boulders, debris, or other high void content substances to a level 1 foot above the top of pipe. Remove ledge rock, boulders, and large stones to provide at least 6-inch clearance from pipe.
- H. Dig bell holes of ample dimension at each joint such that the pipe barrel rests continuously on the bedding.

### 3.05 BACKFILL WITHIN PIPE ZONE

- A. Backfill immediately after pipe is laid. Restrain pipe as necessary to prevent their movement during backfill operations.
- B. Place material completely under pipe haunches in uniform layers not exceeding 4 inches in depth.
- C. Hand (shovel/slice) and tamp along pipe within haunch zone to provide a solid pipe foundation.
- D. Corrugated PP:
  - 1. Backfill pipe in accordance with Standard Detail Plate No. BED-1.
  - 2. Hand (shovel) and thoroughly place pipe bedding material within the exterior corrugation areas adjacent to the pipe.
  - 3. Compact the pipe bedding material within the pipe zone.

### 3.06 BACKFILL ABOVE PIPE ZONE

- A. Use suitable materials meeting the requirements of Backfill Material.
- B. Place in uniform depth layers not to exceed 12 inches before compaction. Complete the compaction of each layer before placing material for the succeeding layer.
- C. Compact each layer by mechanical means until it meets the requirements of MnDOT Spec. 2105.3.F.1 "Specified Density Method." Trenches shall be compacted to a minimum of 95 percent, except to 100 percent in the upper 3 feet:
  - 1. Trenches between existing or future buildings or structures shall be compacted to a minimum of 100 percent for the entire depth of the trench.
- D. The method and means of placement and type of compaction equipment used is at the discretion of the Contractor. However, all portions of the trench backfill must meet minimum specified compaction requirements.
- E. Any deficiency in quantity of backfill material (caused by shrinkage or settlement) shall be supplied at no additional cost to the Owner.
- F. Excavated material not suitable or required for backfill shall be disposed of outside of the Site.
- G. It is assumed that all backfilling of trenches will be performed using on Site, excavated trench material. If the Contractor is unable to meet the specified density requirements using that material due to excess moisture content or other circumstance beyond their control, they shall immediately notify the Engineer of such condition. Following investigation of the circumstances, the Engineer, Contractor, and Owner shall mutually agree upon the proper course of action to address the issue.
- H. Any excavated rock that is placed back in the trench shall be crushed to a maximum rock size of 12 inches and adequately mixed with suitable on Site backfill material before being placed and compacted in the trench.
- I. Corrugated PP: Maintain a minimum 3' cover depth of material above the pipe, before allowing vehicles or heavy construction equipment to travel over the pipe trench.

### 3.07 FIELD QUALITY CONTROL

- A. Density Tests: To be performed by an approved soils testing firm at various locations and depths throughout the Site as directed by the Engineer. Cooperate fully and provide assistance as necessary to complete these tests.
- B. Failed density test areas shall be excavated and re-compacted until the density requirements are met.

## END OF SECTION

## **SECTION 33 05 17**

### **ADJUST MISCELLANEOUS STRUCTURES**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Adjustment of utility structures.
- B. Related Sections:
  - 1. Section 01 57 13 – Temporary Erosion and Sediment Control.
  - 2. Section 33 10 00 – Water Main Utilities.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Bid Items have been provided for various adjustments. Payment at the Bid Unit Price for all items is considered compensation in full for all materials and Work required to furnish and install the Bid Item in place.
  - 2. Adjust Manhole Casting and Adjust Valve Box:
    - a. New and Existing Manholes and Valve Boxes Within Bituminous Surfaced Area:
      - 1) Payment for adjustment to initial lift wearing course grade shall be made for new and existing manholes and valve boxes where no reconstruction of the structure is performed on the basis of each structure adjusted as specified.
      - 2) Payment for adjustment to final wearing course grade for new and existing manholes and valve boxes shall be made for each structure adjusted as specified.
      - 3) Adjust Manhole Casting (Cast Iron Manhole Adjusting Ring): Measurement will be per each structure adjusted by means of furnishing and installing steel adjusting ring as specified.
      - 4) No separate payment for initial adjustment to initial lift wearing course grade will be made for existing structures that are reconstructed. Initial adjustment of the structure shall be considered incidental to the Bid Items for the reconstruction of each type of structure.
    - b. New Manhole and Valve Boxes In Non-Bituminous Surfaced Areas:
      - 1) No separate payment for adjustment to final grade will be made. Adjustment of the structure shall be considered incidental to the Bid Items for the furnishing and installation of each type of structure.
    - c. Existing Valve Boxes In Non-Bituminous Surfaced Areas:
      - 1) Payment for adjustment of the valve box to final grade shall be made for each valve box as specified.
  - 3. Adjust Catch Basin Casting:
    - a. New and Existing Catch Basins:
      - 1) Separate payment for adjustment to interim bituminous curb grade and final concrete curb and gutter grade shall be made for new and existing catch basins on the basis of each structure adjusted, as specified:
        - a) Furnishing and installing erosion control around structure will be paid in accordance with Section 01 57 13.
  - 4. Extend Hydrant Barrel: Measurement will be by the linear foot of adjustment made, including the heavy-duty rod assembly, if required.

5. Valve Box Extension: Payment for the furnishing and installation of valve box extension sections on either new or existing valve boxes shall be made on the basis of the linear feet of extension sections installed.
6. All work associated with the surfacing removal, excavation, material replacement, compaction, and patching necessary for the adjustment of structures within bituminous surfaced areas shall be considered incidental to the adjustment.
7. For street rehabilitation projects, or if required by the Engineer, use of parachute is incidental to manhole adjustment.
8. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

#### 1.03 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  1. ASTM A48 – Specification for Gray Iron Casting.
  2. ASTM D1248 – Polyethylene Plastics Molding and Extrusion Materials.
- B. Minnesota Department of Transportation "Standard Specifications for Construction" 2018 Edition (MnDOT Spec.):
  1. 3733 – Geotextiles.

#### 1.04 DEFINITIONS

- A. Adjust Manhole or Catch Basin Casting: A change in rim elevation accomplished for manholes or catch basins through the addition or removal of adjustment rings only. Adjustment does not include the addition or removal of sections from the structure.
- B. Adjust Valve Box: A change in elevation of the top of the valve box accomplished through the raising or lowering of the existing top section of the valve box only. Adjustment does not include the addition or removal of sections from the valve box.
- C. Remove and Replace Adjustment Rings: The process of removing the existing concrete adjustment rings from an existing structure and placing new rings on manholes and catch basins.

#### 1.05 SEQUENCING AND SCHEDULING

- A. Contractor, Engineer, and Owner shall inspect all existing structures prior to beginning construction.
- B. Owner will remove any foreign material found in the existing structures prior to construction. Remove any foreign material that enters the structures during construction. Notify owner any time foreign materials enter structures regardless of the amount of material.
- C. When temporarily removing existing castings and valve box top sections, place castings and valve top sections in the boulevard area directly behind the curb, and in line with the existing structure for the purpose of locating the plated structure and valve box.
- D. Use care when removing bituminous surfacing around existing structures to avoid damage to existing materials. Replace any castings or valve box materials damaged during the surfacing removal with equal materials at no cost to the Project.
- E. Bituminous street patching associating with the structure adjustment shall be completed the same day as the structure is adjusted, including manhole casting protection.

## **PART 2 PRODUCTS**

### **2.01 ADJUSTING RING**

- A. High-Density Polyethylene (HDPE):
  - 1. Molded high-density polyethylene conforming to ASTM D1248.
- B. Cast Iron Manhole Adjusting Ring:
  - 1. R-1979 Series adjusting ring as manufactured by Neenah Foundry, or approved equal.

### **2.02 ADHESION MATERIALS**

- A. Ram-Nek material, or approved equal.
- B. Cast Iron Manhole Adjustment Ring Adhesive, per manufacture recommendations.
- C. Sealant (For HDPE Rings):
  - 1. DOW 999 – A building caulking and glazing sealant, or approved equal.
  - 2. Open cell polyurethane foam sealant with adhesive backing.

### **2.03 HYDRANT EXTENSIONS**

- A. Sections: Match existing hydrant manufacturer and model.

### **2.04 CASTINGS**

- A. Manhole, Catch Basin Frames, and Covers:
  - 1. Requirement: ASTM A48.
  - 2. Material: Class 35 cast iron. Best grade. Free from injurious defects and flaws.
  - 3. Finish: Coal tar pitch varnish.
  - 4. Finish Preparation: Sandblast.
  - 5. Machine cover and frame contact surface for non-rocking protection.
  - 6. Type and Style:
    - a. NEENAH R-1642 Type "B", Platen Lid, 2 concealed pick holes, or approved equal, for sanitary manholes. Covers stamped with "SANITARY SEWER". Use 2-inch letters.
    - b. NEENAH R-1642 Type "B", Platen Lid, Open Hole, or approved equal, for storm manholes. Covers stamped with "STORM SEWER". Use 2-inch letters
    - c. NEENAH R-1642-A, short casting – 5" height
    - d. NEENAH R-3067-V, and R-3067-VB, or approved equal, for storm sewer catch basin manholes and catch basins.
    - e. NEENAH R-4342, or approved equal, for beehive catch basin manholes.
    - f. NEENAH R-3290-A (Type A grate), or approved equal, for storm sewer catch basins within commercial driveway entrances.
    - g. NEENAH R-1755 G, Water tight casting.
    - h. NEENAH R-3501TB, or approved equal, for storm sewer catch basins within surmountable curb at residential driveway entrances.

### **2.05 VALVE BOX**

- A. Risers:
  - 1. Valve box riser to fit the Tyler No. 6850, 6855, 6860, or 6865 top section and drop lid, or approved equal.
  - 2. Tyler No. 69 gate valve extension screw adjustable, or approved equal.

3. Cast iron valve adjusting rings are not allowed.
4. Conform to the requirements of Section 33 10 00.

## 2.06 GEOTEXTILE

- A. Non-woven geotextile fabric type 1 in accordance with MnDOT Spec. 3733.B for use in conjunction with HPDE rings.

## **PART 3 EXECUTION**

### 3.01 GENERAL

- A. The necessary vertical alignment will be determined by the Engineer and generally as indicated on the schedule of adjustments.
- B. Where existing frame is within 0.10 feet of grade, no adjustment is to be made.
- C. Raise or lower the frame to match the street or gutter.
- D. Protect existing structures from damage.
- E. Prevent sand, concrete, or any other debris from entering the structures.
- F. HDPE rings to be used on all structures.
- G. Adjust all structures located in non bituminous surface areas to final design grade.
- H. Immediately following removal of existing casting and adjusting rings, cover structure opening with suitable steel plate to prevent foreign debris from entering structure. Secure plate to top slab or cone with Ram-Nek.
- I. For street rehabilitation projects, or if required by the Engineer, use parachute or approved equal to prevent debris from entering structures while active work is being done on or near an existing structure.

### 3.02 PREPARATION

- A. Call utility owners to field mark their utility locations.
- B. Verify exact location of existing utilities.

### 3.03 ADJUST MANHOLE AND CATCH BASIN FRAME

- A. HDPE Adjusting Ring:
  1. See Detail STR-18.
  2. Remove all dirt, debris, dust, and other deleterious material from surface prior to placement of first ring.
  3. Install adhesive for manhole adjusting rings as per the following:



<b>Location of Sealant</b>	<b>Type of Sealant</b>
Between casting and last ring:	3/4 inch by 3/4 inch open cell polyurethane foam sealant and 1/2-inch bead of DOW 999
Between intermediate rings:	1/2-inch bead of DOW 999
Between cone/top slab and first ring:	3/4 inch by 3/4 inch open cell polyurethane foam sealant and 1/2-inch bead of DOW 999

4. Sealant to be placed around entire circumference of each unit with no gaps.
  5. Utilize a variety of thickness of flat units and sloping units to match the required grade and slope of the area at the location of the structure:
    - a. Shims are not allowed.
  6. Total Thickness of Rings Allowed: Minimum of 3 inches, maximum of 12 inches.
  7. Wrap entire casting and ring system with geotextile. For structures with cone section, geotextile wrap to extend over a minimum length of 18 inches of the cone.
- B. New adjusting rings shall be used on all casting adjustments, regardless of whether casting is salvaged, existing, or new.
- C. Cast Iron Manhole Adjusting Ring:
1. Install per manufacturer's recommendations.
  2. Apply adhesive as recommended by the manufacture.
  3. Only 1 steel ring allowed for adjustment from initial lift wearing course grade to final wearing course grade.

#### 3.04 ADJUST VALVE BOX

- A. Adjust box by screwing top section up or down.
- B. Prevent sand, chunks of concrete, or any other debris from entering the valve box:
1. Short sections inserted inside the existing top section are not allowed to perform adjustment, unless specified.
- C. Install approved sections as needed for extension by removing top section, installing additional extension, and re-installing top section.
- D. Patch road to match existing pavement section.

#### 3.05 HYDRANT EXTENSIONS

- A. Remove upper section.
- B. Install extension kit as per manufacturer's requirements.
- C. Replace upper and lower rod assemblies with heavy-duty for extensions in excess of 18 inches.
- D. Replace the upper section.

#### 3.06 SCHEDULE OF ADJUSTMENTS

- A. Manholes Outside of Street Areas:
1. Permanently adjust casting to design rim elevation at time of structure installation or reconstruction.

- B. Manholes Within Street Areas with Concrete Curb and Gutter (Final Wearing Course Paved the Same Year as the Initial Lift Wearing Course):
1. At time of structure installation or reconstruction, install casting directly upon top slab or cone section with Ram-Nek material.
  2. Prior to street construction, remove casting from all new and existing manholes and cover structure opening with suitable steel plate. Secure plate to top slab or cone with Ram-Nek.
  3. Following initial lift wearing course paving perform adjustment:
    - a. Locate structure and expose.
    - b. Remove steel plate. Permanently place HDPE rings on structure. Permanently place casting on top ring with adhesive. Wrap filter fabric over casting and rings. For structures with cone section, fabric shall extend a minimum of 18 inches down cone.
    - c. Replace and compact gravel base material. Patch initial lift wearing course around structure:
      - 1) Bituminous patch to be 6 feet by 6 feet, minimum.
    - d. Top of casting to be 1/4 to 3/8 inch lower than the final wearing course grade, as measured with a 6-foot straight edge centered on the structure.
    - e. Perform adjustment no more than 5 working days prior to placement of bituminous wearing course, unless approved by Engineer.
- C. Manholes Within Street Areas with Concrete Curb and Gutter (Final Wearing Course Paved the Following Year or Later):
1. At time of structure installation or reconstruction, install casting directly upon top slab or cone section with Ram-Nek material.
  2. Prior to street construction, remove casting from all new and existing manholes and cover structure opening with suitable steel plate. Secure plate to top slab or cone with Ram-Nek.
  3. Following non-wearing course paving perform adjustment:
    - a. Locate structure and expose.
    - b. Remove steel plate. Permanently place HDPE rings on structure. Permanently place casting on top ring with adhesive. Wrap filter fabric over casting and rings. For structures with cone section, fabric shall extend a minimum of 18 inches down cone.
    - c. Replace and compact gravel base material. Patch initial lift wearing course around structure:
      - 1) Bituminous patch to be 6 feet by 6 feet, minimum.
    - d. Top of casting to be 1/4 to 3/8 inch lower than the initial lift wearing course grade, as measured with a 6-foot straight edge centered on the structure.
    - e. Adjustment of all manholes must be completed within 15 working days after the start of placement of the initial lift wearing course. Adjustment will not be allowed prior to initial lift wearing course paving.
  4. Prior to final wearing course paving (the following year or later), perform adjustment:
    - a. Permanently adjust casting to final grade with steel adjusting ring.
    - b. Top of casting to be 1/4 to 3/8 inch lower than the final wearing course grade, as measured with a 6-foot straight edge centered on the structure.
    - c. Perform adjustment no more than 5 working days prior to placement of bituminous final wearing course, unless approved by Engineer.
- D. Manholes Within Street Areas with Interim Bituminous Mat with Integral Bituminous Curb:
1. At time of structure installation or reconstruction, install casting directly upon top slab or cone section with Ram-Nek material.
  2. Prior to interim street construction, remove casting from all new and existing manholes and cover structure opening with suitable steel plate. Secure plate to top slab or cone with Ram-Nek.
  3. Following the interim wearing course paving perform adjustment:
    - a. Locate structure and expose.

- b. Remove steel plate. Permanently place HDPE rings on structure. Permanently place casting on top ring with adhesive. Wrap filter fabric over casting and rings. For structures with cone section, fabric shall extend a minimum of 18 inches down cone.
    - c. Replace and compact gravel base material. Patch interim non-wearing course around structure:
      - 1) Bituminous patch to be 6 feet by 6 feet, minimum.
    - d. Top of casting to be 1/4 to 1/2 inch lower than the interim non-wearing course grade, as measured with a 6-foot straight edge centered on the structure.
    - e. Adjustment of all manholes must be completed within 15 working days after the start of placement of the interim wearing course. Adjustment will not be allowed prior to interim wearing course paving.
  - 4. Final/permanent street construction - Following reclamation of the interim bituminous mat with integral bituminous curb:
    - a. Remove casting from all manholes and cover structure opening with suitable steel plate. Secure plate to top slab or cone with Ram-Nek.
  - 5. Following non-wearing course paving perform adjustment:
    - a. Locate structure and expose.
    - b. Remove steel plate. Permanently place HDPE rings on structure. Permanently place casting on top ring with adhesive. Wrap filter fabric over casting and rings. For structures with cone section, fabric shall extend a minimum of 18 inches down cone.
    - c. Replace and compact gravel base material. Patch wearing course around structure:
      - 1) Bituminous patch to be 6 feet by 6 feet, minimum.
    - d. Top of casting to be 1/4 to 1/2 inch lower than the final wearing course grade, as measured with a 6-foot straight edge centered on the structure.
    - e. Perform adjustment no more than 5 working days prior to placement of final bituminous wearing course, unless approved by Engineer.
- E. Street Catch Basins:
- 1. Within Concrete Curb and Gutter:
    - a. At time of structure installation, place HDPE rings and casting on dry.
    - b. Establish erosion control around structure per Section 01 57 13. Structure to be allowed to accept runoff during this condition. Basin grate shall not be covered with fabric or other impervious material.
    - c. Immediately prior to concrete curb and gutter installation, remove erosion control and permanently adjust casting to proper grade.
    - d. Pour concrete curb and gutter adjacent to structure, permanently setting casting into curb line.
  - 2. Within Interim Bituminous Mat with Integral Bituminous Curb:
    - a. At time of structure installation, place casting on dry with no adjusting rings.
    - b. Establish erosion control around structure per Section 01 57 13. Structure to be allowed to accept runoff during this condition. Basin grate shall not be covered with fabric or other impervious material.
    - c. Remove erosion control immediately prior to interim non-wearing course paving.
    - d. Prior to placement of interim non wearing course and after placement and tolerancing of gravel base, install adjusting rings such that the top of the curb box (back of casting) is flush with the non-wearing course grade:
      - 1) No sealant between casting and top of adjusting ring.
    - e. Immediately following reclamation of the interim bituminous mat, perform adjustment:
      - 1) Establish erosion control around structure per Standard Detail ERO-4A.
      - 2) Immediately prior to concrete curb and gutter installation, remove erosion control and permanently adjust casting to proper grade.
      - 3) Pour concrete curb and gutter adjacent to structure, permanently setting casting into curb line.

- F. Valve Boxes Outside of Street Areas:
  - 1. Permanently adjust box to design rim elevation at time of valve installation.
- G. Existing Valve Boxes Outside of Street Areas:
  - 1. Permanently adjust box to design rim elevation prior to final restoration work.
- H. Valve Boxes Within Street Areas with Concrete Curb and Gutter (Final Wearing Course Paved the Same Year as the Non-Wearing Course):
  - 1. At time of valve installation, install box.
  - 2. Prior to street construction, lower top section of box sufficiently to avoid damage during street base construction.
  - 3. Perform adjustment following non-wearing course paving:
    - a. Locate box and expose.
    - b. Adjust box to final wearing course grade by raising of top section.
    - c. If top section cannot be raised to proper grade, install valve box extension section.
    - d. Replace and compact gravel base material. Patch bituminous non-wearing course around structure:
      - 1) Bituminous patch to be 4 feet by 4 feet, minimum.
    - e. Top of box to be 3/4 inch lower than the final bituminous wearing course grade, as measured with a 6-foot straight edge centered on the box.
    - f. Perform adjustment no more than 5 working days prior to placement of bituminous wearing course, unless approved by Engineer.
- I. Valve Boxes Within Street Areas with Concrete Curb and Gutter (Final Wearing Course Paved the Following Year or Later):
  - 1. At time of valve installation, install box.
  - 2. Prior to street construction, lower top section of box sufficiently to avoid damage during street base construction.
  - 3. Perform adjustment following non-wearing course paving:
    - a. Locate box and expose.
    - b. Adjust box to non-wearing course grade by raising of top section.
    - c. If top section cannot be raised to proper grade, install valve box extension section.
    - d. Replace and compact gravel base material. Patch bituminous non-wearing course around structure:
      - 1) Bituminous patch to be 4 feet by 4 feet, minimum.
    - e. Top of box to be 3/4 inch lower than the bituminous non-wearing course grade, as measured with a 6-foot straight edge centered on the box.
    - f. Adjustment of valve boxes must be completed within 15 working days after the start of placement of the non-wearing course. Adjustment will not be allowed prior to paving.
  - 4. Prior to final wearing course paving (the following year or later), perform adjustment:
    - a. Remove non-wearing course around valve box. Remove sufficient material to allow for compaction of the gravel base.
    - b. Adjust box to final wearing course grade by raising of top section.
    - c. If top section cannot be raised to proper grade, install valve box extension section.
    - d. Replace and compact gravel base material. Patch bituminous non-wearing course around structure:
      - 1) Bituminous patch to be 4 feet by 4 feet, minimum.
    - e. Top of box to be 3/4 inch lower than the final bituminous wearing course grade, as measured with a 6-foot straight edge centered on the box.
    - f. Perform adjustment no more than 5 working days prior to placement of bituminous wearing course, unless approved by Engineer.

- J. Valve Boxes Within Street Areas with Interim Bituminous Mat with Integral Bituminous Curb:
1. At time of valve installation, install box.
  2. Prior to interim street construction, lower top section of box sufficiently to avoid damage during street base construction.
  3. Perform adjustment following interim non-wearing course paving:
    - a. Locate box and expose.
    - b. Adjust box to interim non-wearing course grade by raising of top section.
    - c. If top section cannot be raised to proper grade, install valve box extension section.
    - d. Replace and compact gravel base material. Patch interim bituminous non-wearing course around structure:
      - 1) Bituminous patch to be 4 feet by 4 feet, minimum.
    - e. Top of box to be 3/4 inch lower than the interim bituminous non-wearing course grade, as measured with a 6-foot straight edge centered on the box.
    - f. Adjustment of valve boxes must be completed within 15 working days after the start of placement of the interim non-wearing course. Adjustment will not be allowed prior to paving.
  4. Final/permanent street construction: Following reclamation of the interim bituminous mat with integral bituminous curb:
    - a. Lower top section of box sufficiently to avoid damage during subgrade preparation.
  5. Perform adjustment following non-wearing course paving:
    - a. Locate box and expose.
    - b. Adjust box to final wearing course grade by raising of top section.
    - c. If top section cannot be raised to proper grade, install valve box extension section.
    - d. Replace and compact gravel base material. Patch bituminous non-wearing course around structure:
      - 1) Bituminous patch to be 4 feet by 4 feet, minimum.
    - e. Top of box to be 3/4 inch lower than the final bituminous wearing course grade, as measured with a 6-foot straight edge centered on the box.
    - f. Perform adjustment no more than 14 working days prior to placement of bituminous wearing course, unless approved by Engineer.

### 3.07 TRAFFIC CONTROL

- A. Place construction advisory signs, 36 inches by 36 inches, stating "Construction Zone" and "Proceed at Your Own Risk" in black letters on an orange field at all entrances to the Project prior to beginning final adjustment of structures within bituminous surfaced areas.
- B. Exposed edges of manhole castings and valve boxes raised prior to bituminous wear course paving shall be painted with "White" or "Pink" paint.
- C. Provide appropriate traffic control devices to protect the traveling public during all phases of the structure adjustment work.

### 3.08 FIELD QUALITY CONTROL

- A. For adjustments made within bituminous surfaced areas, any settlements of the bituminous surfacing below the rim of the adjustment structure will require removal and replacement of the bituminous surfacing at the expense of the Contractor.
- B. Secure manholes and structures immediately after completion or before suspension of operations at the end of working day with castings or suitable alternative device.

- C. Adjust manhole and catch basin frames as described above. Thorough tamping of the material around manhole and catch basin frames is required. Where existing frame is within 0.10 feet of grade, no adjustment is to be made. In such cases the crown or gutter shall be either lowered or raised, as the case may be, to put the street and frame at the same grade.
- D. No shims of any material will be allowed.
- E. Adjust valve boxes as described above. Thorough tamping of the material around the valve box is required. All valve boxes shall be clean, straight, plumb, and keyable, allowing a 4 inch schedule 40 pipe to be placed and centered over the valves operating nut from the street surface. This alignment check will be performed on all valves after the final adjustment of the valve box and prior to placement of the bituminous wearing course. Supply the alignment tool (4 Inch Schedule 40 Pipe) and perform this test with the Owner's representative.
- F. Settlements around structure adjustments that occur during the correction period and result in the casting being higher than the bituminous wearing course will be repaired in a manner acceptable to the Owner at the Contractor's expense.

### **END OF SECTION**

## **SECTION 33 05 28**

### **CONDUIT FOR PRIVATE UTILITIES**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Placement of PVC and ductile iron pipe conduits to be used at a later date by private utility contractors, developers, and the City of Woodbury.
- B. Related Sections:
  - 1. Section 33 05 05 – Trenching and Backfilling
  - 2. Section 33 12 12 - Water Services
  - 3. Section 33 31 14 - Sanitary Sewer Services

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Conduit Crossings: Based on the number of conduits per crossing. Measurement shall be per linear foot of crossing. For example, if a location is determined to require 3 conduits, the Contractor would be paid for the length of the crossing (not the total length of all 3 conduits) under the Bid Item for 3 conduits. Payment at the Unit Price will be considered compensation in full for furnishing and installing conduits as shown in the Drawings, including excavation, backfill, compaction, and steel fence posts, regardless of the number of conduits in the trench excavation:
    - a. It should be noted that due to the estimation required for Drawing preparation, the quantities of private utility crossings actually constructed may vary significantly from those given in the Bid Form.
    - b. The Engineer reserves the right to increase or decrease the conduit quantities with no change to the Contract Unit Price. No additional compensation will be considered or allowed for changes to the estimated quantities or for the deletion of any of these Bid Items in their entirety.
    - c. For most crossings, the 4-Inch Diameter PVC conduit is of adequate size for the private utility companies to place their facilities. If a 6-Inch conduit is required, measurement shall be identical to that for the 4-Inch diameter conduits with payment made under a separate Bid Item for 6-Inch Conduit.
  - 2. Irrigation Conduit Crossing: Measurement and Payment shall be made based on the linear foot of pipe installed, including 4 inch ductile iron pipe, trench, excavation, backfill, and steel fence posts markers.
  - 3. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 SEQUENCING AND SCHEDULING**

- A. Install conduit after the public utilities are completed and after the street sub-grade and aggregate backfill work is complete and prior to the gravel base improvements.
- B. Bid Items are included in the Bid Form for crossings consisting of single or multiple conduits, based on estimates made at the time of Drawing preparation.

- C. At the pre-construction meeting, a final plan of proposed crossings will be presented to the Contractor based on the actual needs of each private utility company. Irrigation crossings will be provided by the Developer. The location of the City's conduit will also be identified on this final plan.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Conduit: 4-inch and 6-inch diameter PVC, Schedule 40 conforming to Section 33 31 14.
- B. Markers: Steel fence posts, 5 feet in length.
- C. Irrigation Conduit: 4-inch diameter ductile iron pipe conforming to Section 33 12 12.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Excavation and Backfill to conform to Section 33 05 05.

### **3.02 INSTALLATION**

- A. Conduit Trenching:
  - 1. In general, underground conduit shall be installed by trenching.
  - 2. The location of each crossing will be staked by the Engineer at the time of construction to assist the Contractor in proper placement of conduits both horizontal and vertical locations.
  - 3. Install conduit as shown on Detail STR-12. Mark ends of crossing locations with steel fence posts. One post required at each end of a crossing, regardless of number of conduits within that crossing.
  - 4. Trenches for the crossings shall be backfilled and compacted to the same standards as the water and sewer utility trenches.
  - 5. Excess excavated material shall be removed and disposed of off the Site.
  - 6. Irrigation conduits shall be 4 inch, ductile iron pipe, installed 4 feet below the design street grade, and shall extend 4 feet beyond the back of curb on both sides of the street, or as directed by Engineer.

### **3.03 FIELD QUALITY CONTROL**

- A. The Engineer reserves the right to reject any material or workmanship not in accordance with the Specifications either before or after installation.
- B. After trenches are excavated and conduit is placed, the Engineer shall be notified so that an inspection may be made before backfilling.
- C. All trench backfill shall be compacted by mechanical means and by "Quality Compaction Method."

## **END OF SECTION**



## **SECTION 33 08 30**

### **COMMISSIONING OF SANITARY SEWER UTILITIES**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

**A. Section Includes:**

1. Testing of sanitary sewer pipe, manholes, fittings, and miscellaneous appurtenances.

##### **1.02 PRICE AND PAYMENT PROCEDURES**

**A. Measurement and Payment:**

1. Televising Sanitary Sewer: Measurement will be based upon units of linear feet of pipe televised, regardless of size and type. Pipe will be measured from centerline of structure to centerline of structure. Payment will be compensation for pipe preparation, televising, providing televising report, and all other associated costs.
2. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 REFERENCES**

**A. American Society of Testing and Materials (ASTM):**

1. D3034 – Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
2. F679 - Standard Specification for Poly (Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings.
3. F1417 - Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines using Low-Pressure Air.

**B. National Association of Sewer Service Companies (NASSCO):**

1. PACP – Pipeline Assessment Certification Program

##### **1.04 SEQUENCING AND SCHEDULING**

**A. Gravity Pipe Deflection Testing:**

1. Complete all street and utility construction over pipe segment prior to testing.
2. Shall be conducted at least 30 days after the pipe has been backfilled to finished grade.

**B. Televising Sanitary Sewer:**

1. Notify Engineer 48 hours in advance of the televising of all pipes.
2. Complete all required mandrel and air testing prior to televising.
3. Start televising no sooner than 30 days, but no later than 60 days after all utility, excavation, and street subgrade work is completed as part of this contract.

##### **1.05 SUBMITTALS**

**A. Televising Report:**

1. Submit 1 copy of the Written Report and Video Report within 30 days of completion of televising

2. Report Requirements:
  - a. Each run shall consist of a starting and ending structure number and a zero reading on the counter at center of the starting structure.
  - b. Examine each service wye by using the pan and tilt feature.
  - c. Location, length and identify sags within the flowline of the pipe of 10% or greater, example 0.06' for an 8" diameter pipe.
  - d. Location in change in pipe material to be noted.
  - e. The video camera operator shall type into the video the station (distance), wye location on either the left or right side of the pipe, and any problems they notice while televising the sewer lines.
  - f. Take a still photograph at any questionable joint or possible defect.
3. Provide a Written Report with a graphic cross section of the pipe showing the manholes, all wye connections, and defects. This report shall include PACP codes and descriptions
4. Submit a Video Report in a DVD format with audio, including a printable version of the Written Report and full video of all televised pipe runs.

## **PART 2 PRODUCTS**

Not Used.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Perform televising pipeline inspections in accordance with NASSCO Pipeline Assessment and Certification Program (PACP). When requested provide the require certification for personnel preforming the actual work.
- B. Commence test procedures only when pipe and structures are clean and free of dirt, water, or other foreign matter. Pipe cleaning shall be performed in accordance with NASSCO Jetter Code of Practice.

### **3.02 FIELD QUALITY CONTROL**

- A. Engineer will observe all tests and visually inspect the Work for compliance.
- B. Provide all material, equipment, and labor required to test the sanitary sewer systems.
- C. Gravity Pipe Leak Testing:
  1. General:
    - a. Test all systems (pipe and structures) for leakage before being put in service. Notify Engineer of the date and time for each test 1 day prior to actual testing.
  2. Low Pressure Air Test:
    - a. Diameter: Less than or equal to 24 inches.
    - b. Must meet criteria set forth in ASTM F1417.
    - c. Pipe shall be cleaned but may be wetted. Pneumatic balls shall be used to plug the ends at manholes. Low-pressure air shall be introduced into plugged line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any groundwater pressure that may submerge the pipe. At least 2 minutes shall be allowed for the pressure to stabilize before readings are taken and the timing started. During this time, check all plugs with soap solution to detect plug leakage. If any plugs are found to leak, air shall be bled off, the plugs shall be retightened, and the air shall be reintroduced into the line.

- d. The sewer line under test will be accepted as having passed the air test if the pressure does not drop more than 0.6 psig in less time than 1/2 minute per inch in diameter of the pipe being tested. The minimum starting pressure is 3.6 psig.
  - e. Requirement may be waived for reconstruction projects where reconnection of active sewer services prevents testing with permission from Owner.
- D. Gravity Pipe Deflection Testing:
  - 1. Required for all flexible pipe.
  - 2. Deflection Testing Methods:
    - a. Pipe Diameters Through 24 Inches: Pull mandrel through the pipe by hand (without aid of mechanical pulling devices).
    - b. Pipe Diameters Greater Than 24 Inches Through 36 Inches: Deflections shall be determined by use of a mandrel or a method submitted to and approved by the Engineer. If mandrel is used, it shall be pulled through the pipe by hand (without aid of mechanical pulling devices).
    - c. Pipe Diameters Greater Than 36 Inches: Deflection measurements shall be determined using a mandrel, rigid bar, a circular rigid template, or by a method approved by the Engineer. If mandrel is used, it shall be pulled through the pipe by hand (without aid of mechanical pulling devices).
  - 3. Deflection testing shall be done in the presence of the Engineer.
  - 4. 5-percent deflection allowance.
  - 5. Mandrel Diameter Requirements:
    - a. Diameter equal to 95 percent of the base inside diameter noted in Appendix XI of ASTM C3034 for PSM PVC pipe (SDR pipe) and calculated from Appendix X2 of ASTM F679 for PS 46 or 115 pipe.
    - b. Mandrel shall be constructed of rigid steel, be non-adjustable, and have an odd number of legs (9 legs minimum). Its effective length shall not be less than its nominal diameter.
  - 6. Deflection Template/Bar Requirements:
    - a. The circular template diameter (or rigid bar length) shall be equal to the mandrel diameter requirements as determined above.
    - b. Circular templates shall be constructed of rigid materials and be non-adjustable.
    - c. Rigid bars shall have a 1-inch diameter circular section, be constructed of steel, and be non-adjustable.

### 3.03 REQUIREMENTS FOR TEST FAILURES

- A. Leak Test Failure:
  - 1. Repair piping as necessary to conform to product requirements.
  - 2. All repair work shall be subject to approval by the Engineer.
  - 3. Chemical type sealants added to the test water will not be permitted.
  - 4. The Engineer may require removal and replacement of pipe in failed test sections.
  - 5. Pay for the cost of replacement, repair, and re-testing of failed pipe sections.
- B. Deflection Test Failure:
  - 1. Owner reserves the right to measure the deflection of all flexible pipe at any time during the correction period. Deflections greater than 5 percent of the inside diameter of the pipe shall be considered failure. Re-excavate the trench, re-compact the backfill material, and restore the surface with no additional compensation for such work. Re-rounding of pipes that fail the deflection test will not be allowed.
  - 2. Damaged pipe shall not be reinstalled, but shall be removed from the Site.

### 3.04 SANITARY SEWER CLOSED CIRCUIT TELEVISION INSPECTION

#### A. Televising:

1. Newly installed sanitary sewer segments must be in a clean and ready condition prior to the television inspection.
2. Immediately clean any lines found to be dirty prior to televising. Costs for all such cleaning shall be the responsibility of the Contractor.
3. Provide sufficient water to run through the new sanitary sewer system prior to televising lines to be able to distinguish any sags or alignment problems with the pipe.
4. Personnel completing televising must be PACP certified.
5. Final acceptance of the video report will require the pipe to be clean as a new pipe.

#### B. General:

1. Provide a camera that will be self-propelled and will have the ability to tilt up and down and pan left and right. The camera must provide color images.
2. Speed shall not exceed 30 feet per minute.

#### C. Defects:

1. Immediately correct any defects, faulty joints, cracked pipe, or other deficiency noted by the television inspection.
2. A plan for repair shall be presented to and approved by the Owner and Engineer prior to the repair occurring.
3. Re-televising all corrected pipe runs after correction.
4. Any costs associated with correction and re-televising of the sewer system will be paid by the Contractor.

### **END OF SECTION**

## **SECTION 33 10 00**

### **WATER UTILITIES**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

**A. Section Includes:**

1. Water main pipe, hydrants, valves, fittings, and miscellaneous appurtenances.

**B. Related Sections:**

1. Section 01 33 00 - Submittal Procedures
2. Section 01 50 00 - Temporary Facilities and Controls
3. Section 33 05 05 - Trenching and Backfilling
4. Section 33 05 17 - Adjust Miscellaneous Structures
5. Section 33 12 12 - Water Services

##### **1.02 PRICE AND PAYMENT PROCEDURES**

**A. Measurement and Payment:**

1. Water Main: Measurement and payment will be based upon the units listed below:
  - a. Water Main Pipe: Measurement will be based upon units of linear feet for each size and type of pipe installed, as measured along the axis of pipe, without regard to intervening valves or fittings. Water main over depth shall not be measured. Payment at the Bid Unit Price shall include furnishing and installing pipe complete in place as specified:
    - 1) All required poly encasement on water main system shall be considered part of the Bid Items for the installation of the various components of the system. No separate measurement or payment for poly encasement shall be made.
    - 2) Furnishing and installing Water Marker Ball shall be considered incidental to the installation of the pipe.
  - b. Valve and Box: Measurement will be based on each size and type of Valve and Box installed. Payment at the Unit Price shall include furnishing and installing the Valve and Box, and valve adaptor complete in place as specified:
    - 1) Nut Extensions: Measurement will be per linear foot of extension installed. Payment at the Unit Price shall include furnishing and installing the nut extension complete in place as specified including stainless steel set screws.
  - c. Hydrant: Measurement will be based on units of each Hydrant installed. Payment at the Unit Price shall include furnishing and installing the Hydrant, including fiberglass flag and hydrant marker, as well as furnishing and delivering the extra flag to the Owner:
    - 1) A separate Bid Item will be provided for hydrants requiring vertical bends per WAT-9. Payment will include cost of the hydrant described above and bend.
  - d. DIP Fittings: Measurement shall be based on the total fitting weight installed, not including accessories, as shown in AWWA C153/A21.53, latest revision (provide weights from supplier for crosses). Payment at the Unit Price shall include all costs related to furnishing and installing the DIP fitting, all hardware and accessories, and required labor. Any provisions, such as corporations, rods, copper pipe, Water Marker Ball, etc. installed on the plugs of the stub for testing purposes or for future irrigation or service connections, shall be considered incidental to the plug. No separate measurement or compensation shall be made for such provisions:
    - 1) Fittings required for construction of irrigation services will be paid under this Bid Item.
    - 2) Removal of the copper after successful testing will be incidental to this Bid Item.

- e. Connect to Existing Water Main: Measurement will be based on each connection made, according to size. Payment of this Bid Item shall be considered complete compensation for all work associated with the connection to the existing water main, including removal and disposal of the existing plug.
- f. All required testing shall be considered incidental to the installation of the water main system. No direct or separate payment for testing will be made.
- g. Wet Tap: Measurement shall be based on each Wet Tap installed by size. Payment at the Bid Unit Price shall include stainless steel tapping sleeve and hardware, valve, and valve box.
- h. Joint Restraint: shall be considered incidental to water main installation with no direct payment made.
- i. Water Main Offset: Measurement shall be based on each offset made, according to size. Payment shall include all pipe, fittings, restraints, and materials to complete the offset per the Standard Detail.
- j. Insulation: Measurement will be based on square yards of Insulation at the specified thickness. Payment shall be made at the Unit Price and will include furnishing and installation of the Insulation.
- k. Cut In Valve: Measurement will be based on the number of valves installed, according to size. Payment shall include all water main cutting, removal, pumping, water main pipe, sleeves, fittings, and valve and box needed to complete the installation.
- l. Irrigation Service: Measurement and Payment will be made under each Bid Item to construct in accordance with the Detail Drawing.
- m. Recondition and Paint Hydrant: Measurement and payment will be based on units of each Hydrant that is reconditioned and painted and shall include sandblasting, primer coat, top coat, protection, materials, and all work associated with the reconditioning and painting:
  - 1) Replace Hydrant Flag: This Bid Item is intended for reconditioned hydrants only. Measurement will be per each. Payment will include all costs related to furnishing and installing a new fiberglass flag after the hydrant has been painted. Salvaging and delivering the existing flag to the City of Woodbury Public Works Department will be considered incidental.
- n. Repair Existing Valve: Measurement will be by each valve repaired. Payment shall include excavation & backfilling, exposing all T-bolts for inspection, remove & replace stem O-rings (2 or 3), and remove & replace the following bolts & nuts with Grade 316 stainless steel:
  - 1) Wrench nut
  - 2) Wrench nut cap screw
  - 3) Bonnet gasket, bolts, & nuts
  - 4) Stuffing box gasket, bolts, & nuts
- 2. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. American Water Works Association (AWWA):
  - 1. C104 - American National Standard for Cement Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
  - 2. C105 - American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.
  - 3. C111 - American National Standard for Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
  - 4. C116 - American National Standard for Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings for Water Supply Service.
  - 5. C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
  - 6. C153 - American National Standard for Ductile-Iron Compact Fittings for Water Service.
  - 7. C502 - AWWA Standard for Dry-Barrel Fire Hydrants.

8. C504 - AWWA Standard for Rubber-Seated Butterfly Valves.
9. C515 - AWWA Standard for Resilient-Seated Gate Valves for Water Supply Service.
10. C550 - American National Standard for Protective Interior Coatings for Valves and Hydrants.
11. C600 - AWWA Standard for Installation of Ductile-Iron Water Main and Their Appurtenances.
12. C651 - AWWA Standard for Disinfecting Water Mains.

B. American Society of Testing and Materials (ASTM):

1. A48 - Gray Iron Castings.
2. A126 - Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
3. A536 - Standard Specification for Ductile Iron Castings.
4. A674 - Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for Water or Other Liquids.
5. C578 - Specification for Rigid, Cellular Polystyrene Thermal Insulation.

#### 1.04 SUBMITTALS

A. Submit Product Data for the following items consistent with Section 01 33 00:

1. Pipe, fittings, valves, and hydrants.
2. Joint restraint and corrosion resistant coatings.
3. Hydrant paint and primer.
4. Fire Hydrant Marker.

#### 1.05 SEQUENCING AND SCHEDULING

- A. Notify the Owner a minimum of 48 hours prior to performing Work. At this time, also notify the City Fire Department of the intended shutdown.
- B. Notify all customers connected to water system to be shut down 48 hours in advance of shut down.
- C. The Owner must open and close the existing valves for this part of the operation. The Owner is responsible for flushing the mains after the connection is completed; however, the Contractor shall assist the Owner as necessary.
- D. Field quality control testing shall be performed in the following sequence:
  1. Hydrostatic pressure test
  2. Conductivity
  3. Bacteria
- E. Successfully complete required tests and inspections before beginning street construction.

#### 1.06 USE OF CITY WATER SYSTEM

- A. Conform to Section 01 50 00.

### **PART 2 PRODUCTS**

#### 2.01 DUCTILE IRON PIPE (DIP) AND FITTINGS

- A. General Requirement: AWWA C151/A21.51.
- B. Cement-mortar lining conforming to AWWA C104/A21.4.

- C. Class: As shown on Drawings.
- D. Fittings: AWWA C153/A21.53, latest revision, Ductile Iron Compact Fittings, 250-psi working pressure, AWWA C111/A21.11 latest revision, mechanical joint or push-on:
  - 1. All fittings shall be fusion bonded epoxy coated per ANSI/AWWA C116/A21.
- E. Cor-Blue bolts required on all mechanical joint fittings.
- F. Wrap all pipe and fittings according to pipe encasement requirements.

## 2.02 HYDRANT

- A. General Requirements: AWWA Standard C502.
- B. Specified Hydrant: WB-67-250, or approved equal.
- C. Approved Manufacturer: Waterous Pacer, or approved equal.
- D. Two 2-1/2 inch hose connections, National Standard Thread.
- E. One 4-1/2 inch steamer, Nation Standard Thread.
- F. National standard operating nut.
- G. 5-inch valve opening.
- H. 6-inch mechanical joint pipe connection.
- I. Break-off flange with breakable rod coupling.
- J. 7 feet - 6 inch cover.
- K. 16-inch high traffic section.
- L. Nozzle caps attached to hydrant with metal chains.
- M. Stainless steel hardware.
- N. Fiberglass Flag: Hydrafinder Hydrant Marker, or approved equal:
  - 1. White fiberglass rod, with 4 red reflective bands without a bulb end.
  - 2. Minimum 60 inches long, 3/8 inch diameter.
- O. Hydrants placed where the ground water table is less than 8 feet below the ground surface shall have the drain holes plugged and shall be equipped with a tag stating the need for pumping after use.
- P. High-pressure valve seat (referred to as the Colorado Kit).
- Q. Color: Painted Waterous Enamel No. V1814-R at the place of manufacture.
- R. After installation and testing is complete, the "field coat" of paint shall be applied with a brush.



## 2.03 GATE VALVE AND BOX

- A. General Requirement: AWWA C515.
- B. Ductile iron body valves, bronze mounted.
- C. Non-rising stem (NRS), opening by turning counter clockwise, 2 inches square operating nut.
- D. O-ring seals.
- E. Mechanical joint ends conforming to AWWA C111/A21.11.
- F. Stainless steel hardware.
- G. All internal and external surfaces of the valve body and bonnet shall have a coating complying with ANSI/AWWA C550 and C116/A21.16.
- H. Wrap gate valves with pipe encasement.
- I. Valve Boxes:
  - 1. 3-piece, ductile iron, screw-type.
  - 2. Adjustable for 7-1/2 foot depth of cover.
  - 3. Valve and box considered as integral units.
  - 4. 5-1/4 inch diameter shafts.
  - 5. "Stay put" type drop covers, "WATER" on top with extended skirts.
  - 6. Valve Adaptor: Adaptor Inc., or approved equal.

## 2.04 BUTTERFLY VALVE AND BOX

- A. General Requirement: AWWA C504.
- B. Mechanical joint valve ends conforming to AWWA C111/A21.11.
- C. AWWA C504 Class 250.
- D. All stainless steel hardware required.
- E. Wrap butterfly valve with pipe encasement.
- F. Valve Box:
  - 1. 3-piece, ductile iron, screw-type.
  - 2. Valves and boxes to be considered integral units.
  - 3. 5-1/4 inch diameter shafts.
  - 4. Round or oval bases.
  - 5. "Stay put" type drop covers, bearing the word "WATER" on top with extended skirts.
  - 6. Valve Adaptor: Adaptor Inc., or approved equal.

## 2.05 CONDUCTIVITY STRAP

- A. As specified by the pipe manufacturer.

## 2.06 WET TAP

- A. Stainless steel tapping sleeve.
- B. 3/4-inch gaskets.

## 2.07 JOINT RESTRAINT

- A. Mechanical Joint Restraint: Not allowed on existing cast iron pipe:
  - 1. Ductile iron conforming to ASTM A536.
  - 2. Working Pressure: Minimum 250 psi.
  - 3. EBAA Iron, Inc. Mega-lug, Star Pipe Products Stargrip, or approved equal. Mega-lug and retainer glands are not allowed on existing cast iron pipe.
  - 4. Casting body and wedge assemblies coating:
    - a. Epoxy per ANSI/AWWA C116/A2.
    - b. Bond coating per manufacturer's recommendations:
      - 1) Mega-Bond, Star-Bond, or approved equal.

## 2.08 PIPE ENCASEMENT

- A. Material: Polyethylene film conforming to AWWA C105/A21.5 and ASTM A674, tube form.
- B. Color: Black.
- C. Film Marking Requirements: Conform to AWWA C105/A21.5 and ASTM A674, including AWWA/ASTM standard, corrosion protection warning and applicable range of nominal pipe diameter size(s) every 2 feet along its length.

## 2.09 INSULATION

- A. Polystyrene Insulation: Extruded type conforming to ASTM C578, Type VI, VII, or V.

## 2.10 CORPORATION STOP

- A. Conform to the requirements of Section 33 12 12.

## 2.11 COPPER SERVICE PIPE

- A. Conform to the requirements of Section 33 12 12.

## 2.12 WATER MARKER BALL

- A. 4" Diameter 3M Passive Marker Ball, or approved equal.
- B. Color of ball shall be "Blue" for Water.

## 2.13 NUT EXTENSION

- A. Set screws are required and shall be stainless steel, Type 316 bolt.

## 2.14 RECONDITION AND PAINT HYDRANT

- A. Materials shall conform to the following:
  - 1. Primer: Apply Devoe High Performance Coating, Devran 201H Epoxy Primer.
  - 2. Paint (hereinafter "Top Coat"): Apply Devoe High Performance Coating, Devthane 379 Polyurethane:
    - a. Color: Safety Red
    - b. Finish: Glossy Enamel
  - 3. Proposed paint material substitution for consideration as an approved equal shall be submitted in writing to the Engineer for review and consideration. Otherwise, furnish materials exactly as specified.

## 2.15 HYDRANT MARKER: OUT OF SERVICE

- A. 10.5-inch outside diameter yellow plastic ring with black text stating "out of service".

# PART 3 EXECUTION

## 3.01 PREPARATION

- A. Conform to the requirements of Section 33 05 05.

## 3.02 INSTALLATION OF PIPE

- A. Install pipe and fittings in accordance with the manufacturer's instructions and with the details shown on the Drawings.
- B. Permanently support, remove, relocate, or reconstruct existing utility pipes, cables, structures, or other appurtenances when they obstruct the line, grade, or location of the pipe or appurtenance.
- C. Remove foreign matter or dirt from the inside of pipe to insure each pipe is clean before it is installed.
- D. All jointing of mechanical joint pipe and push-on joint pipe in accordance to AWWA C600.
- E. Outside of the spigot and the inside of the bell, wire brush, wipe clean and dry. Keep pipe ends clean until joints are made.
- F. Lay and maintain pipe and appurtenances to the alignment, grade, and location shown on the Drawings. No deviation from the Drawing alignment, grade, or location is allowed, unless approved by the Engineer. No pipe shall be laid in water or when the trench conditions are unsuitable for such Work.
- G. Provide conductivity throughout the water system by use of conductivity strap, except for HDPE and PVC water main pipe.
- H. Cap or plug end of each pipe until next pipe is ready to be laid to prevent debris or groundwater from entering the pipe.
- I. Installing Fittings:
  - 1. General Requirements: AWWA C600.
  - 2. Set and jointing to existing pipe and fittings as specified for cleaning, laying, and joining pipe.

- J. Dead End Lines:
  - 1. Install plug tapped with a 1-inch corporation at all stubs.
  - 2. Extend a temporary section of 1-inch copper to above grade for flushing and testing.
  - 3. Remove all but 12 inches of the temporary copper and backfill trench after flushing and testing is completed.
  - 4. Crimp over short stub to keep the corporation clean.
  - 5. Following the removal of the 1-inch copper bleed off, install a Water Marker Ball at a depth of 3 feet below finish grade, vertically above the end of the dead end water line.
- K. Wrap all ductile iron pipe and fittings with pipe encasement.
- L. Backfilling: Conform to Section 33 05 05.

### 3.03 INSTALLATION OF HYDRANT

- A. Location determined by Engineer. A grade stake and location stake will be provided by the Engineer before the hydrant may be set.
- B. Set on 8-inch concrete block, or approved equal concrete base.
- C. Brace according to Drawings.
- D. After each hydrant has been set, place around the base of the hydrant not less than 1 cubic yard of coarse filter aggregate (MnDOT Spec. 3149.2H). Carefully place 2 layers of polyethylene, minimum 4 mm thickness each, over the rock to prevent backfill material from entering voids in the drain rock.
- E. Wrap the hydrant assembly with pipe encasement to the bottom of the break off flange.
- F. Maintain hydrants in a plumb position during the backfilling operation.
- G. Attach a fiberglass marker to the hydrant using an existing flange bolt located at the back of the hydrant.
- H. Furnish 1 additional marker for each hydrant to the Owner.
- I. Attach an out of service hydrant marker to all Hydrants at the time of installation. Out of service hydrant markers are to be removed once all testing has passed and that segment of water main has been accepted by the City and put into service.

### 3.04 INSTALLATION OF VALVE

- A. Set and joint valves to new pipe in the manner as specified for cleaning, laying, and jointing pipe. Location to be determined by the Engineer.
- B. Valves and boxes shall be supported on an 8-inch concrete block, and encased with coarse filter aggregate (MnDOT Spec. 3149.2H) as shown on the Drawings.
- C. Install valve adaptor.
- D. Maintain valve box centered and plumb over the operating nut of the valve.
- E. Set top of valve box flush with the existing surface to provide 12 inches of upward adjustment.

- F. Wrap valves with pipe encasement. Conform to AWWA C105.
- G. For valve installed with extra depth, add nut extension to maintain 7 foot depth.

### 3.05 ANCHORAGE

- A. Restrain all hydrant leads, lateral lines, bends, fittings, and valves using Megalug glands as per Drawings.
- B. Provide concrete thrust blocking for all bends, tees, hydrants, and plugs:
  - 1. Requirements per Drawings.
  - 2. Block tees, plugs, and hydrants to same requirements as 90 degree bend.
  - 3. Thrust blocking for 4", 6", and 8" fittings shall be precast concrete blocking.
  - 4. Thrust blocking must be poured-in-place concrete for fittings 12" and larger. Wood or precast concrete segmental block is not allowed for thrust blocking.
  - 5. Wrap plug in poly prior to pouring of thrust block in anticipation of future removal.
- C. Where lines terminate with plugs, restrain the plug and next 2 joints with mechanical joint restraints in conjunction with the blocking, as directed by the Engineer.

### 3.06 INSULATION

- A. Review insulation installation with Engineer:
  - 1. Place insulation between water pipe and sanitary pipe when water main or service is within 1 foot above or below the sanitary pipe.
  - 2. Place insulation between storm sewer pipe and water main or water service when pipes are separated by less than 2 feet.

### 3.07 INSTALLATION OF IRRIGATION SERVICE

- A. Install at locations shown on the Drawings and as directed by Engineer.
- B. Install per Standard Detail SER-5.

### 3.08 PIPE CONFLICTS (WATER MAIN OFFSET)

- A. Install water main offset per Standard Detail as shown on Drawings.
- B. All offset piping shall be DIP.
- C. Megalug type joint restraints.

### 3.09 RECONDITION AND PAINT HYDRANT

- A. Project Coordination:
  - 1. Conduct pre-construction meeting with Engineer or his designee to review Work schedules for all stages of Work, review material application process and discuss any questions before work begins.
  - 2. Provide written documentation of primer and paint material used for Project.
- B. Preparation:
  - 1. Salvage flag and deliver to Woodbury Public Works Department.
  - 2. Sandblast the entire fire hydrant to base metal to ensure good adhesive bonding of the paint.

3. Produce smooth surface ready to receive primer material in accordance with manufacturer's recommendations.
  4. During painting and blasting operations, provide adequate protection and containment to prevent damage to adjacent structures and property. This includes protecting the area surrounding the hydrant from overspray through the use of a template or ground covering around the hydrant. The contractor is responsible for any and all damage resulting from painting and/or blasting operations. Remedy all damages within 48 hours of notification.
- C. Coatings:
1. Primer and Top Coat shall be applied to the hydrant by using a spray method application. The use of painting mitts is not allowed on any surface.
  2. Primer: Immediately after surface preparation, apply in accordance with manufacturer's instructions at a rate to provide a uniform dry film thickness of 2.0 to 3.0 mils. Care must be taken to ensure uniform application of material around bolt heads, underside of nozzles, and other surface irregularities. Paint films that show sags, blisters, etc. will not be accepted.
  3. Prior to Top Coat application, primed surface must be clean, dry, undamaged, and free of all contaminants including salt deposits.
  4. Top Coats: Apply in accordance with manufacturer's instructions at a rate to provide a uniform dry film thickness of 2.0 to 3.0 mils. Maintain minimum coverage around bolt heads, underside of nozzles, and other surface irregularities.
  5. Produce glossy, smooth, and uniform surface finish.
  6. Follow product data/application instructions and manufacturer's recommendations in completing the work.
- D. Process: follow all requirements for working in public right-of-way, and maintain full compliance with specified traffic control and applicable OSHA Standards. Remove all Primer and Paint Top Coat material that is over-sprayed, dripped, spilled or deposited on sidewalks or other ground surfaces as directed by Engineer at the Contractor's expense.
- E. Furnish and install new flag after hydrant has been painted.

### 3.10 PROTECTION

- A. Existing valves and hydrants shall be operated in accordance with Section 01 50 00 Temporary Facilities and Controls - 3.03, unless under emergency situations.
- B. Securely plug all water main openings promptly before suspension of Work at any time to prevent earth or other substances from entering the water main.
- C. Mark valve boxes and structures susceptible to being hit by construction or vehicular traffic.
- D. All newly installed core blue nuts and bolts that are marred or scratch during installation, shall have an Asphalt Aerosol Spray applied to the surface.

### 3.11 FIELD QUALITY CONTROL

- A. Scope:
  1. Perform hydrostatic pressure, disinfection, and conductivity tests.
  2. The Engineer will observe and verify all tests and visually inspect final Work for compliance.
- B. Hydrostatic Pressure Test:
  1. Minimum Test Pressure: 150 psi
  2. Test Duration: 2 hours

3. Criteria: No drop in pressure allowed.
4. Testing Gauge: Liquid filled, 4-1/2 inches diameter, labeled in 1-psi increments, such as Ashcroft Model 1082, or approved equal.
5. Test all lines, including hydrant leads, water services, and stubs.
6. Any valved section of water system may be isolated for pressure testing.
7. Sequence and sectioning of water system for pressure testing shall be proposed by Contractor and approved by the Engineer prior to testing.
8. Notify the Engineer immediately if it is determined that the existing valve is not holding pressure during the hydrostatic pressure test.
9. The Contractor may request the City to perform leak detection testing on existing valves if the Contractor has tried testing the line and the required testing pressure will not hold. If the valve is found not to be leaking, the Contractor will be responsible for the testing costs.
10. If a faulty valve is suspected, a meeting with the Engineer and Owner will be necessary to attempt pressure testing prior to the Contractor continuing. No claims by the Contractor for extra work related to pressure testing will be processed if this meeting has not occurred.

C. Disinfection:

1. General Requirement: AWWA C651 – Disinfecting Water Mains (Tablet Method).
2. Place hypochlorite tablets in each section of pipe and all appurtenances:
  - a. Attach tablets to top of pipe with a food grade adhesive, such as denture grip.
  - b. The estimated number of tablets required per 20-foot length of pipe based on 3-1/4 grain available chlorine per tablet is as follows:

	<u>Diameter</u>	<u>No. of Tablets</u>
1)	4 Inches	1
2)	6 Inches	2
3)	8 Inches	3
4)	10 Inches	4
5)	12 Inches	5
6)	16 Inches	9
7)	18 Inches	12
8)	20 Inches	14
9)	24 Inches	20
10)	30 Inches	28

- c. Use specified number of tablets to disinfect water main for 24 hours with at least 50 ppm available chlorine, with a residual of at least 10 ppm throughout the length of the main at the end of the 24-hour period.
3. Fill main with water at a velocity of less than 1 foot per second if tablet method is used.
4. Begin flushing after the chlorinated water has been allowed to disinfect the new pipe for 24 hours.
5. 1 bacteria test location is required for every 1,200 feet of water main installed, with a minimum of 2 sample locations per Project. Locations shall be identified by the Engineer. Two bacteria test samples will be taken at each location with a minimum 24 hour separation of the sampling.
6. The Engineer will coordinate all testing with a certified independent testing firm. Assist with the sampling process by operating valves if necessary.
7. The owner will be responsible for costs associated with bacteria testing of samples obtained. Contractor is responsible for costs associated with bacteria testing of any failing tests.
8. Water mains needing reflushing or to be rechlorinated, must be done to meet Department of Health and AWWA requirements. Perform re-flushing or re-chlorination within 48 hours of notification of failing tests.

- D. Conductivity (DIP):
  - 1. Conductivity to be provided throughout the water system by use of copper straps or approved conductive gaskets with copper inserts.
  - 2. Test Current: 350 amps at approximately 30 volts for 4 minutes, then 400 amps for 1 minute without fluctuation.
  - 3. Fill lines with water prior to test.
  - 4. Test all lines, including hydrant leads, water services, and stubs.
- E. Trench Backfill – Compaction: The Owner shall have an independent testing laboratory perform, as a minimum, the following tests. The location of the tests will be determined by the Engineer:
  - 1. 1 density test for every 300 feet of trench at varying depths.
- F. Adjust valve boxes per Section 33 05 17. Thorough tamping of the material around the valve box is required. All valve boxes shall be clean, straight, plumb, and keyable, allowing a 4" schedule 40 PVC pipe to be placed and centered over the valves operating nut from the street surface. This alignment check will be performed on all valves after the final adjustment of the valve box and prior to placement of the bituminous wearing course. Supply the alignment tool (4" Schedule 40 PVC Pipe) and perform this test with the Owner's representative.

### 3.12 REPAIR EXISTING VALVE

- A. Repair valves within project limits as shown on Drawings or as directed by Engineer (rehabilitation and reconstruction projects):
  - 1. Remove and replace wrench nut.
  - 2. Remove and replace wrench nut cap screw.
  - 3. Remove and replace bonnet bolts and nuts.
  - 4. Remove and replace stuffing box bolts and nuts.
  - 5. Remove and replace stem O-rings (3 each).
  - 6. Use Grade 316 stainless steel bolts and nuts.

### **END OF SECTION**



## **SECTION 33 12 12**

### **WATER SERVICES**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

**A. Section Includes:**

1. Construction of water service pipe, corporation stops, curb stops, and all appurtenances.

**B. Related Sections:**

1. Section 01 33 00 - Submittal Procedures
2. Section 33 05 05 - Trenching and Backfilling
3. Section 33 10 00 - Water Utilities

##### **1.02 PRICE AND PAYMENT PROCEDURES**

**A. Measurement and Payment:**

1. Water Service Line: Measurement by linear foot of each size and type of pipe measured along the axis of the pipe, from centerline of the water main to termination as shown on the Drawings with no regard to intervening fittings. Payment at the Bid Unit Price per foot shall include cost of all pipe, laying, excavation, poly encasement for ductile iron pipe, backfilling, and testing:
  - a. Placement and compaction of the aggregate material around the corporation stop and gooseneck is incidental to the service line.
  - b. Supplying and installing required markers is incidental to the service line.
  - c. Ductile iron fittings will be paid per Section 33 10 00.
  - d. Any provisions, such as corporations, rods, copper pipe, Water Marker Ball, etc. installed on the plugs of a stub for testing purposes or for future service connections, shall be considered incidental to the plug.
2. Corporation Stop: By physical count of each type installed, according to size:
  - a. Placement and compaction of the required support is incidental.
  - b. Saddle if required is incidental.
3. Curb Stop: By physical count of each type installed, according to size:
  - a. Required support is incidental.
  - b. Installation of water service marker ball is incidental to curb stop.
4. Gate Valve and Box will be paid per Section 33 10 00.
5. Material, placement, compaction, and removal of excess trench material to be included in the Bid Unit Price for Water Service Line.
6. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.
7. HDPE irrigation service: Measurement by linear foot of each size and type measured along the axis of the pipe, from centerline of the water main to termination as shown on the Drawings with no regard to intervening fittings. Payment at the Bid Unit Price per foot shall include cost of all pipe, laying, excavation, backfilling, and testing:
  - a. Any fittings or transitions required for the HDPE irrigation service will be considered incidental to the installation of the pipe.
  - b. Place 12 GA solid copper tracer wire along entire length of service pipe.
8. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid

### 1.03 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. B88 - Class K Copper Water Service Pipe
  - 2. D3035 - Standard Specification for Polyethylene (PE) Plastics Pipe (DR-Pr) Based on Controlled Outside Diameter
- B. American Water Works Association (AWWA):
  - 1. C901 - AWWA Standard for Polyethylene (PE) Pressure Pipe and Tubing, 1/2 Inch (13 mm) Through 3 Inches (76 mm), for Water Service

### 1.04 SUBMITTALS

- A. Submit the Product Data for the following items consistent with Section 01 33 00:
  - 1. Pipe and fittings
  - 2. Corporation stop and curb boxes
  - 3. Saddle

### 1.05 SEQUENCING AND SCHEDULING

- A. Install sanitary sewer, water main, and all pipe deeper than the services prior to the installation of the services.
- B. Install water service in same trench as the sanitary sewer service, wherever possible.
- C. Perform testing of new water main prior to reconnecting existing services.

## **PART 2 PRODUCTS**

### 2.01 SERVICE PIPE

- A. Copper Water Tube: 1 inch through 1 ½ inches for buried service shall be seamless, Type K water tube conforming to ASTM B88:
  - 1. Fittings shall be designed for working pressures up to 150 psi. Fittings used in service lines shall be designed for connection to the service line by threads, brazing, and/or flaring (compression fittings not allowed).
- B. Ductile Iron Pipe (DIP): Conform to Section 33 10 00.
- C. High Density Polyethylene (HDPE) Pipe: Conform to AWWA C901 and ASTM D3035, designation code PE 3408, PC 160/DR 11 for sizes less than 4 inches. Shall include 12 GA solid copper tracer wire.

### 2.02 CORPORATION STOP

- A. Approved Manufacturers: Mueller Minneapolis Pattern H-15000, Ford Type 600, Hayes No. 5200, or McDonald No. 4701.
- B. Threaded on outlet for flared connection with copper service pipe.
- C. Threaded on inlet end with standard tapered corporation cock thread.

## 2.03 CURB STOP

- A. Approved Manufacturers:
  - 1. Curb Stops - 1 Inch: Mueller Oriseal, Minneapolis Pattern H-15151, Ford No. B22, Hayes No. 5155 or McDonald No. 4714.
  - 2. Curb Stops - 1-1/2 Inches: Mueller Oriseal H-15154, Minneapolis pattern, Ford No. B22 Series ball valves, Hayes Nuseal No. 4008 or McDonald No. 6104 ball valves.
- B. Same size and connection type for inlet and outlet.
- C. Full opening through the valve body with no smaller restriction allowed.

## 2.04 CURB BOX

- A. Approved Manufacturers:
  - 1. Mueller H10300
  - 2. McDonald 5610
- B. Adjustable height seven feet to eight feet.
- C. Stationary rods.

## 2.05 WATER SERVICE MARKER BALL

- A. 4" Diameter 3M Passive Marker Ball, or approved equal.
- B. Color of ball shall be "Blue" for Water.

## 2.06 SADDLE

- A. Smith Blair double stainless steel strap 317 or approved equal.
- B. Saddles are to be used at locations shown in Drawings unless otherwise approved by Engineer.

## 2.07 GATE VALVE AND BOX

- A. Conform to the requirements of Section 33 10 00.

## 2.08 DIP FITTINGS

- A. Conform to the requirements of Section 33 10 00.

# **PART 3 EXECUTION**

## 3.01 INSTALLATION

- A. Install in accordance with Detail Plate SER-1a shown on Drawings.
- B. Governing Code: Minnesota Plumbing Code and any local ordinances that may apply.
- C. Preparation: Conform to Section 33 05 05.
- D. Locations of services to be staked by Engineer during construction.

- E. Copper Water Service Line:
  - 1. Parallel and upstream, 3 to 5 feet, of the sewer service line in the same trench.
  - 2. Minimum 7.5 feet of cover from finished grade.
- F. Corporation Stop:
  - 1. Tap into main only when water main is under pressure.
  - 2. Use 2 layers of pipe tread sealant tape on corporations as a thread lubricant and sealant, or product approved by Owner.
  - 3. Provide support for corporation and gooseneck per Detail.
  - 4. Install saddle per manufactures recommendations.
  - 5. Operation must be completed with open wrench.
- G. Curb Stop:
  - 1. Support on full size pre-cast segmental manhole block.
  - 2. Provide support for curb stop per Detail.
  - 3. Grade stakes will be furnished to establish elevations.
  - 4. Operation must be completed with open wrench.
  - 5. **Note: The curb box will be installed by others at a later date.**
- H. DIP Water Service Line:
  - 1. Minimum 7.5 feet of cover from finished grade.
  - 2. Use mega-lugs from tee at main to end of service.
  - 3. Place a plug, tapped with 2" corporation stop, at the end of the water service. Attach copper to the corporation and extend to the surface to bleed off air and to perform pressure tests, conductivity tests, and other items. Review such provisions with the Engineer prior to construction.
- I. Water Service Marker Ball:
  - 1. Install at the end of the service line.
  - 2. At a depth of 3 feet below finish grade.
  - 3. Vertically above the end of the service line.
- J. All trenches shall be backfilled and compacted in accordance to Section 33 05 05.

### 3.02 FIELD QUALITY CONTROL

- A. Do not backfill trench until the service has been inspected and approved by the Engineer.
- B. Pressure Testing: All water services will be pressure tested in conjunction with the water main, conforming to Section 33 10 00.
- C. The Owner shall have an independent testing laboratory perform, as a minimum, the following tests. The location of the tests shall be determined by the Engineer:
  - 1. 1 density test for every 4 services installed at varying depths.
- D. Required documentation shall include completing the "Sewer and Water Service Data Plan Sheet" per detail Drawings, at the time of installation:
  - 1. Measure and record the longitudinal distance from sanitary sewer wye to the water service line (perpendicular to the water service line) or from the sanitary sewer service line to the corporation stop/tee (perpendicular to the water service line).
  - 2. Measure and record the longitudinal distance between the sanitary sewer plug and the water curb stop or plug (perpendicular to water line).
  - 3. Measure and record the length of water line material for each service pipe installed.

### 3.03 PROTECTION

#### A. Mark each curb stop and plug with:

1. Solid 4 inches by 4 inches by 8 feet wood post extending 4 feet above and 4 feet below grade.

**END OF SECTION**

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**SECTION 33 31 00**  
**SANITARY UTILITY SEWER PIPING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Sanitary sewer gravity pipe, fittings, and miscellaneous appurtenances.
- B. Related Sections:
  - 1. Section 01 33 00 - Submittal Procedures
  - 2. Section 01 57 13 - Temporary Erosion and Sediment Control
  - 3. Section 02 41 13 - Selective Site Demolition
  - 4. Section 33 05 05 - Trenching and Backfilling
  - 5. Section 33 08 30 - Commissioning of Sanitary Sewer Utilities
  - 6. Section 33 31 14 - Sanitary Sewer Services
  - 7. Section 33 39 00 - Sanitary Utility Sewer Structures

**1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Sanitary Sewer Pipe: Measurement will be per lineal foot for each size and type for furnishing and installing pipe complete in place as specified, including excavation, backfilling, and compaction. Pipe will be measured from center to center of manholes, or to the connection point of the existing pipe:
    - a. PVC pipe bedding will be paid in accordance with Section 33 05 05.
    - b. Improved pipe foundation material, if necessary, shall be per Section 33 05 05.
    - c. Furnishing and installing plugs and sewer marker ball on dead end lines will be considered incidental to the pipe.
  - 2. Connect to Existing Manhole: Measurement shall be on the basis of each and shall be considered to include all excavation, labor, materials, and equipment necessary to make the required connection, including reconstructing bench/invert.
  - 3. Connect to Existing Manhole (Core Drill): Measurement will be per each, regardless of the pipe size required. Payment will be compensation for excavating, core drilling the manhole and reconstructing bench/invert.
  - 4. Connect to Existing Pipe: Measurement will be per each, according to size, and shall be considered to include all excavation, labor, materials, and equipment necessary to make the required connection, including removal/salvaging of existing plug.
  - 5. Wyes: Measurement will be per each, according to size and type. Payment at the Unit Price will be considered compensation in full for all work and costs to furnish and install the wye as specified:
    - a. Cut-In Wye: Measurement will be per each, according to size and type. Payment shall be considered compensation in full for all work, including excavation, backfilling, labor, materials, concrete encasement (or PVC saddle if approved), and equipment necessary to cut in the wye as specified.
  - 6. Insulation: Measurement will be based on square yards of Insulation at the specified thickness. Payment will include furnishing and installation of the Insulation.
  - 7. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. C578 - Specification for Rigid, Cellular Polystyrene Thermal Insulation.
  - 2. C76 - Specification for Reinforced Concrete Culvert, Drain, and Sewer Pipe.
  - 3. D1784 - Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (PVC) Compounds.
  - 4. D3034 - Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
  - 5. D3212 - Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
  - 6. F477 - Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
  - 7. F679 - Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
- B. American Water Works Association (AWWA):
  - 1. C105 - American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.
  - 2. C111 - American National Standard for Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
  - 3. C116 - American National Standard for Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings for Water Supply Service.
  - 4. C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
  - 5. C153 - American National Standard for Ductile-Iron Compact Fittings for Water Service.
  - 6. C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 Inches Through 12 Inches, For Water Distribution.
  - 7. C905 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 Inches Through 48 Inches, For Water Transmission and Distribution.

### 1.04 SITE CONDITIONS

- A. Sanitary sewer lines are shown on the Drawings in a general way. Anticipate minor variations in both horizontal and vertical directions in locating existing system.

### 1.05 SUBMITTALS

- A. Submit Product Data for the following items consistent with Section 01 33 00:
  - 1. Pipe and fittings.
  - 2. Transition couplings.

### 1.06 SEQUENCING AND SCHEDULING

- A. Do not pursue Work causing shut off of utility services (gas, water, electric, telephone, TV, etc.) to consumers until the utility owner is contacted and all consumers are notified of the shut-off schedule.
- B. Verify vertical and horizontal location of sanitary sewers sufficiently in advance of installing new pipe to determine the extent of conflict, if any.
- C. Successfully complete required inspections and testing before restoration of surface.



## **PART 2 PRODUCTS**

### **2.01 SOLID WALL PVC PIPE**

- A. PSM Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings (4 Inches Through 15 Inches Diameter):
  - 1. General: Pipe and fittings shall be made of compounds conforming to ASTM D1784 in accordance with the material requirements of ASTM D3034.
  - 2. Design: Integral bell gasketed joint and a minimum wall thickness conforming to SDR 26 or 35 as shown on the Drawings.
  - 3. Joints: Push-on type only with the bell-end grooved to receive a gasket. Elastomeric Seal (Gasket): A basic polymer of synthetic rubber conforming to ASTM F477. Natural rubber gaskets will not be accepted.
  - 4. Service Wye: Through pipe shall be push-on type only with the bell-end grooved to receive a gasket, 45 degree branch shall be solvent weld type connection.
  - 5. Marking: Each pipe shall be identified with the name of the manufacturer, or trademark and code, nominal pipe size in inches, the PVC cell classification, and "Specification D3034."
- B. Polyvinyl Chloride (PVC) Pipe and Fittings (18 Inch Through 48 Inch Diameter):
  - 1. General: Pipe and fittings shall be made of compounds conforming to ASTM D1784 in accordance with the material requirements of ASTM F679.
  - 2. Design: Integral bell gasketed joint with a minimum wall thickness conforming to PS 46 or PS 115 as shown on the Drawings.
  - 3. Joints: Elastomeric gasket joints providing a water-tight seal conforming to ASTM F477.
  - 4. Marking: Conform to ASTM F679.
- C. Polyvinyl Chloride (PVC) Pressure Pipe and Fittings:
  - 1. General: Pipe shall be made of compounds conforming to ASTM D1784 in accordance with the material requirements of AWWA C900 (4 inches to 12 inches diameter pipe) or AWWA C905 (14 inches to 48 inches diameter pipe).
  - 2. Design: Cast-iron-pipe-equivalent outside diameter with a minimum pressure class (PC) or dimension ratio (DR) as shown on the Drawings.
  - 3. Joints: Integral bell with elastomeric gasket joints providing a water-tight seal conforming to ASTM D3212 or ASTM F477.
  - 4. Fittings: Conform to Ductile Iron Pipe(DIP) and Fittings under this Section.
  - 5. Marking: Conform to AWWA C900 and C905 respectively.

### **2.02 DUCTILE IRON PIPE (DIP) AND FITTINGS**

- A. General Requirement: Pipe to conform to AWWA C151/A21.51.
- B. Pipe Class: As shown on Drawings.
- C. Fittings: AWWA C153/A21.53, Ductile Iron, 250-psi working pressure, AWWA C111/A21.11 latest revision, mechanical joint or push-on:
  - 1. All fittings shall be fusion bonded epoxy coated per ANSI/AWWA C116/A21.
- D. Pipe and Fitting Lining: Protecto 401® Ceramic Epoxy (Ceramic Quartz Filled Amine Cured Novalac Epoxy), PVC Lined Ductile Iron or approved equal.
- E. Marking: Conform to AWWA C151/A21.51.

## 2.03 REINFORCED CONCRETE PIPE (RCP)

- A. General Requirement: Reinforced concrete pipe conforming to ASTM C76, Wall B with gasketed joint forming a water-tight seal conforming to ASTM C443.
- B. Pipe Class: As shown on the Drawings.
- C. Materials: Conform to the requirements of ASTM C76 Wall B with circular reinforcing. Profile gaskets shall be synthetic rubber, circular in cross-section, and conform to ASTM C1619 Class C.
- D. Pipe Joints: Bell and spigot conforming to ASTM C361.
- E. Marking: Each pipe shall be identified with the name of the manufacturer identification of plant, date of manufacture, the pipe class, and specification design.
- F. Corrosion Resistant Liner: HDPE liner shall be Studliner as manufactured by GSE Lining Technology, Inc. SureGrip (CPL) as manufactured by AGRU, or approved equal. The liner shall be installed in the entire 360 degree of the pipe interior surface. Joints shall be welded in the field by a certified installer after pipe installation.

## 2.04 INSULATION

- A. Polystyrene Insulation: Extruded type conforming to ASTM C578, Type VI, VII, or V.

## 2.05 DIP ENCASEMENT

- A. Material: Polyethylene film conforming to AWWA C105/A21.5 and ASTM A674, tube form.
- B. AWWA/ASTM standard, corrosion protection warning and applicable range of nominal pipe diameter size(s) every 2 feet along its length.

## 2.06 TRANSITION COUPLING

- A. Coupling consisting of an elastomeric sleeve with incorporating stainless steel tension bands, tightening mechanism, and less than 0.01 inch thick shear ring conforming to ASTM C1173, Type A.
- B. Separate bushings are not allowed without approval from the Engineer.

## 2.07 SEWER MARKER BALL

- A. 4" Diameter 3M Passive Marker Ball, or approved equal.
- B. Color of ball shall be "Green" for Water.

# PART 3 EXECUTION

## 3.01 PREPARATION

- A. Excavation and Preparation of Trench: Conform to Section 33 05 05.

- B. By-Pass Pumping: Contractor is responsible for all items required to maintain sewer flows during construction of the new sanitary sewer line. All Work and costs for this are considered incidental to the Project, unless otherwise specified.
- C. Erosion control and dewatering in conformance with Section 01 57 13.

### 3.02 PIPE INSTALLATION

- A. Trench Excavation and Backfill: Conform to Section 33 05 05.
- B. Lay and maintain pipe appurtenances to the alignment, grade, and location shown on the Drawings and/or staked in the field. No deviation from the Drawing and/or staked alignment, grade, or location is allowed, unless approved by Engineer. Deviation from grade in excess of 0.02 percent (with no intermediate high points, level sections, or reverse invert slope) may be cause for removal and relaying pipe at the Contractor's expense.
- C. Maintain reference line and grade with laser equipment or other equipment approved by the Engineer. Periodically check equipment for adjustment and accuracy. Correct deficiencies in equipment, reference line, and reference grade. Take precautions to prevent deflections in reference line and grade.
- D. Non-Conforming Pipe Installation: Remove and reinstall.
- E. Inspect pipe for defects and cracks while suspended immediately prior to installation.
- F. Install pipe from lower to higher invert elevation with uniform and smooth invert line.
- G. Install pipe length spigot ends pointing in the direction of flow.
- H. No pipe is to be laid in water or when trench conditions are unsuitable for such Work.
- I. Jointing:
  - 1. In conformance with recommendations of manufacturers of pipe and joint material.
  - 2. All joints must be watertight.
  - 3. Hand fill and compact all bell depressions with granular bedding materials to prevent joints from sagging or movement.
- J. Cleaning and Protection:
  - 1. Remove all dirt and debris from the interior of each pipe length as the Work progresses.
  - 2. Protect the exposed end of the pipe with temporary covers or plugs.
  - 3. Protect in place pipe from damage and dislocation.
- K. Flexible Pipe Installation: Conform to ASTM D2321.
- L. Sanitary Sewer Service Connections:
  - 1. Wye:
    - a. Wye to be at 45-degree angle from horizontal.
    - b. Plugs installed with Atlastic 77, Sonolastic Sealant, or approved equal, or specifically designed for the opening to be plugged.
  - 2. Risers: Conform to Section 33 31 14.
- M. Installation of Insulation:
  - 1. Place insulation over pipe in locations as shown on the Drawings.

2. Insulation is to be placed wherever sanitary sewer line comes within 3 feet of any storm structure or line, or within 5 feet of the ground surface.

N. Sewer Marker Ball:

1. Install at the end of stub sewer main plug.
2. At a depth of 3 feet below finish grade.
3. Vertically above the end of the sewer main plug.

### 3.03 CONNECT TO EXISTING SYSTEM

A. Connect to Existing Structure:

1. Connect to existing structure at location shown on the Drawings.
2. If rubber boot exists at manhole opening, connect new pipe to the boot and secure.
3. If manhole opening does not contain rubber boot or the existing boot is damaged, core drill opening in the structure, and install a rubber boot in manhole opening prior to connection of pipe.
4. Make repairs to the structure required due to the Work performed, including installation of doghouse.
5. If necessary, the invert shall be reconstructed to accommodate new flow location. Reconstruction of invert will also be necessary if pipe sizes increase.

B. Connect to Existing PVC Pipe (Stub):

1. Locate and expose end of existing stub.
2. Remove existing plug and connect to pipe.

C. Cut-in Wye:

1. Cut-in Wye at location shown on Drawings. Type and size shown on Drawings.
2. Remove existing mainline pipe as necessary to make connection per Section 02 41 13.
3. Connect wye to existing mainline pipe with transition coupling. Pour concrete encasement around coupling.
4. In lieu of cutting in a wye, PVC saddles will be accepted following Engineer review and acceptance of shop drawings provided by Contractor.
5. Perform excavation and backfilling of trench per Section 33 05 05.

### 3.04 MANHOLE INSTALLATION

- A. Conform to the requirements of Section 33 39 00.

### 3.05 PROTECTION

- A. Plug all entrances and openings to the system promptly and before suspension of operations at the end of working day.
- B. Mark each plug location with 4 inch by 4 inch timber to above existing grade.
- C. At connections to existing system, temporarily plug the existing pipe with acceptable device until newly installed sewer lines have been accepted.

### 3.06 FIELD QUALITY CONTROL

- A. Trench Backfill – Compaction: The Owner shall have an independent testing laboratory perform, as a minimum, the following tests. The location of the tests will be determined by the Engineer:
1. 1 density test for every 300 feet of trench at varying depths (per 10 foot depth increments).

2. 1 gradation test per Project for pipe bedding.
  3. 1 gradation test per Project for improved pipe foundation material.
- B. Testing in conformance with requirements of Section 33 08 30.
- C. Re-test after corrective measures are completed.
- D. Cleanup:
1. Cleaning Pipe and Structures:
    - a. If newly installed mains and structures are kept clean during construction, cleaning will not be required.
    - b. If newly installed mains and/or structures become dirty due to negligence of the Contractor, cleaning will be performed at the sole expense of the Contractor.
  2. The bailing or flushing method of cleaning pipe is acceptable only if adequate provisions, acceptable to the Engineer, for keeping dirt and debris out of the existing sewer system. Jetting may be required.
  3. Complete prior to final inspection for acceptance.

## **END OF SECTION**

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**SECTION 33 31 14**  
**SANITARY SEWER SERVICES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Sanitary sewer service pipe and all appurtenances.
- B. Related Sections:
  - 1. Section 01 33 00 - Submittal Procedures
  - 2. Section 33 05 05 - Trenching and Backfilling
  - 3. Section 33 08 30 - Commissioning of Sanitary Sewer Utilities
  - 4. Section 33 31 00 - Sanitary Utility Sewer Piping

**1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Service Pipe: Measurement will be by linear foot for each size and type of pipe installed (including 3-foot end piece) as measured along the axis of the pipe with no regard to intervening fittings. Payment at the Bid Unit Price shall be compensation in full for all Work and costs, including excavation, pipe, fittings, 6-inch PE sleeve (as specified), backfill, and trench compaction.
  - 2. Pipe Bedding for the PVC Sanitary Sewer Service Pipe: Measurement and payment shall be per Section 33 05 05.
  - 3. Improved Pipe Foundation Material: Measurement and Payment shall be per Section 33 05 05.
  - 4. No Bid Items have been included for service plugs or marking service ends. Payment for these items shall be included in the linear foot price for Service Pipe.
  - 5. Service Riser Pipe: Measurement will be by linear foot for each size measured from the wye connection to the top of the last riser section. Payment at the Unit Price will be considered payment in full for all work and costs associated with this Bid Item, including Riser Service Marker Ball and concrete reinforcement of the riser, wye, and main sewer.
  - 6. Connect to Existing Wye or Riser: Measurement will be per each. Payment will include all costs related to excavating, exposing, and connecting to an existing wye or riser that was installed by others, including removal of existing plug.
  - 7. Connect to Existing Riser
  - 8. Required measurements of service installations shall be considered incidental to the service installation.
  - 9. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

**1.03 REFERENCES**

- A. American Society of Testing Materials (ASTM):
  - 1. D1784 - Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (PVC) Compounds
  - 2. D1785 - Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
  - 3. D2564 - Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems

4. D2665 - Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent (DWV) Pipe and Fittings
5. D2672 - Specification for Joints for IPS PVC Pipe Using Solvent Cement
6. D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings

#### 1.04 SYSTEM DESCRIPTION

- A. This Work shall consist of the construction of sanitary sewer services in accordance with the requirements of the Contract.
- B. It is the intent of these Specifications to require the same quality of Work be received on the house services in the way of grade and alignment as is required on the main lines and laterals.

#### 1.05 SUBMITTALS

- A. Submit the following items consistent with Section 01 33 00:
  1. Product data for the following items:
    - a. Pipe and fittings
  2. Provide and record information on the "Sewer and Water Service Data Sheet" (Contractor Responsibility) in accordance with 3.02.D. The Data Sheet for recording required measurements will be provided by Engineer.

#### 1.06 SITE CONDITIONS

- A. All Work must be confined to within the limits of construction easements or public right-of-way.

#### 1.07 SEQUENCING AND SCHEDULING

- A. Install sanitary sewer, water main, and all pipe deeper than the services prior to the installation of the services.
- B. Install sanitary sewer service in same trench as the water service or as directed by the Engineer.

### **PART 2 PRODUCTS**

#### 2.01 MANUFACTURED UNITS

- A. Poly (Vinyl Chloride) (PVC) Schedule 40 Plastic Pipe and Fittings:
  1. General: Pipe and fittings shall be made of compounds conforming to ASTM D1784 in accordance with the material requirements of D1785 and ASTM D2665. PVC fittings shall conform to ASTM D2665. Belled end pipe shall have tapered sockets conforming to ASTM D2672.
  2. Design: Integral belled pipe with a minimum wall thickness conforming to Schedule 40.
  3. Solvent Cement Joints: The solvent cement used to join pipe and fittings shall meet the requirements of ASTM D2564.
  4. Risers: conform to same requirements as service pipe.

#### 2.02 BEDDING MATERIAL

- A. See Section 33 05 05.



## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Installation to be in accordance with the Detail Plate shown on Drawings.
- B. Governing Code: Minnesota Plumbing Code and any local ordinances that may apply.
- C. Locations of services to be staked by Engineer during construction.
- D. PVC Risers:
  - 1. Pour concrete casement around connection per Detail SER-2.
  - 2. Support pipe on undisturbed trench slope for entire riser length.
  - 3. Slip joint connection of 4-inch PVC riser to wye.
- E. Minimum 1/4 inch per foot (2 percent) grade, unless otherwise directed by the Engineer.
- F. Installation and fittings: Similar to main line sanitary sewer pipe installation, conforming to the requirements of Section 33 31 00.
- G. Install pipe bedding for PVC sanitary sewer services per Section 33 05 05.
- H. The installation of solvent cemented joints shall be in accordance with ASTM D2855.
- I. Place glue-on plug at end of service.
- J. All proposed service line locations are shown on the Drawings.
- K. Provide and record information on the "Sewer and Water Service Data Sheet" (Contractor Responsibility), in accordance to 3.02.D.

### **3.02 FIELD QUALITY CONTROL**

- A. Do not backfill trench until the service has been inspected and approved by the Engineer.
- B. Low pressure air and infiltration testing shall conform to Section 33 08 30.
- C. The Owner shall have an independent testing laboratory perform, as a minimum, the following tests. The location of the tests shall be determined by the Engineer:
  - 1. 1 density test for every 4 services installed, at varying depths.
- D. Required documentation at the time of installation:
  - 1. Field measurement of length of each sanitary sewer and water service installed.
  - 2. Field measure the depth from the surveyed grade stake provided by the Owner to the invert of the 45 degree bend adjacent to the curb stop.
  - 3. Field measurements as identified on Detail Plate SER-9A.
  - 4. Field measurements for Riser/45 degree bend closest to the main:
    - a. Field measure the depth from the surveyed grade stake provided by the Owner to the invert of the 45 degree bend.
    - b. Horizontal distance from 45 degree bend to center of main pipe
    - c. Length of vertical riser pipe
  - 5. Provide Engineer with record of measurements on a weekly basis.

### 3.03 PROTECTION

- A. Mark end of new service as shown on Standard Detail.

**END OF SECTION**

**SECTION 33 39 00**  
**SANITARY UTILITY SEWER STRUCTURES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Sanitary sewer manholes and miscellaneous appurtenances.
- B. Related Sections:
  - 1. Section 01 33 00 - Submittal Procedures
  - 2. Section 33 05 17 - Adjust Miscellaneous Structures
  - 3. Section 33 05 05 - Trenching and Backfilling
  - 4. Section 33 31 00 - Sanitary Utility Sewer Piping

**1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Refer to Section 33 31 00 for gravity sewer pipe pay items.
  - 2. Sanitary Sewer Manhole: Measurement will be per linear foot of depth from final rim elevation to lowest invert elevation based on the diameter of the manhole. Payment will include the manhole, manhole frame and casting, and adjusting rings in place as specified on the Drawings:
    - a. Separate payment shall be made in accordance with Section 33 05 17 for placement of frame, casting, and adjustment rings.
    - b. 70-percent partial payment will be made upon installation of the structure and 30-percent payment will be made upon final completion of doghouses and inverts.
  - 3. Construct Manhole Over Existing Pipe: Measurement will be per linear foot of depth from final rim elevation to lowest invert elevation based on the diameter of the manhole. Payment will include the manhole, manhole frame and casting, adjusting rings in place as specified in the Drawings, connection to the existing pipe, and any necessary modifications to existing pipe and manhole to complete the connection.
  - 4. Inside Drop Inlet Pipe: Drop inlets will be measured by length from the lowest invert of the manhole to the invert of the pipe being served by the drop inlet. Payment shall be considered compensation in full for all work, including PVC C900 drop pipe, PVC C900 Tee (modified), PVC C900 90° bend, 20 feet of PVC C900 pipe outside of structure, and poured in place invert & benches.
  - 5. Sanitary Sewer Manhole (HDPE Lined): Measurement will be per linear foot of depth from final rim elevation to lowest invert elevation based on the diameter of the manhole. Payment will include the manhole, manhole frame and casting, and adjusting rings in place as specified on the Drawings:
    - a. Separate payment shall be made in accordance with Section 33 05 17 for placement of frame, casting, and adjustment rings.
    - b. 70-percent partial payment will be made upon installation of the structure and 30-percent payment will be made upon final completion of doghouses and inverts.
  - 6. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. C150 - Specification for Portland Cement
  - 2. C443 - Specification for Joints for concrete Pipe and Manholes, Using Rubber Gaskets
  - 3. C478 - Specification for Precast Reinforced Concrete Manhole Sections

### 1.04 SITE CONDITIONS

- A. Manhole locations are shown on the Drawings in a general way. Anticipate minor variations in both horizontal and vertical directions in locating existing system.

### 1.05 SUBMITTALS

- A. Submit Product Data for the following items consistent with Section 01 33 00:
  - 1. Gaskets
  - 2. Joint sealants
  - 3. Manufacturers recommended installation procedures for jointing
  - 4. Mortar mix
- B. Submit shop drawings for the following items consistent with Section 01 33 00:
  - 1. Manholes, including reinforcing, joints, pipe connections, and castings.
  - 2. Shop drawings shall indicate complete information for fabrication and installation of units. Include the following:
    - a. Plans and elevations locating and defining all material furnished by manufacturers.
    - b. Sections and details showing connections, cast-in items, field installed lifting devices, capacities, all openings, and their relation to the structure.
- C. Submit Manufacturer's Certificate of Compliance for the following items consistent with Section 01 33 00:
  - 1. Castings
  - 2. Precast manhole sections and steps
- D. Manhole/Catch Basin Elevation Report:
  - 1. Complete the report attached to the end of this Section for each structure as it is constructed. The completed report shall be submitted each week to the Engineer or the Engineer's designated representative at some mutually agreeable time.
- E. Inside Drop Inlet Pipe per Detail Plate SAN-7.

### 1.06 QUALITY ASSURANCE

- A. The quality of all materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the Engineer or other representative of the Owner. Such inspection may be made at the place of manufacture or on the Work after delivery, or at both places and the materials shall be subject to rejection at any time on account of failure to meet any of the requirements specified herein. Material rejected after delivery to the Site shall be marked for identification and shall be removed from the Site at once. All materials which have been damaged after delivery will be rejected and if already installed shall be removed and replaced entirely at the Contractor's expense.

- B. At the time of inspection, the materials will be carefully examined for compliance with the appropriate ASTM Standard and this Section and with the approved manufacturer's drawings. All precast manhole sections shall be inspected for general appearance, dimension, "scratch-strength," blisters, cracks, roughness, soundness, etc. The surface shall be dense and close-textured.
- C. Manhole Design:
  - 1. Have the manhole sections and top and bottom slabs designed and the detailed drawings prepared by a Professional Engineer, experienced in precast concrete manhole design, who is registered in the Project's state.

## **PART 2 PRODUCTS**

### **2.01 COMPONENTS**

- A. Manholes:
  - 1. Precast concrete sections conforming to ASTM C478 and this Section:
    - a. No lift holes permitted.
    - b. No structures constructed either partially or completely from segmental block will be accepted.
    - c. No structures with any cracks will be accepted.
    - d. All sections shall be cured by an approved method and shall not be shipped nor subjected to loading until the concrete compressive strength has attained 4,000 psi.
    - e. The date of manufacture and the name and trademark of the manufacture shall be clearly marked on the inside of each precast section.
    - f. Precast inverts to match pipe size and pipe grade through manhole (with flat grades, manhole inverts will not be allowed to have a 0.10 foot drop).
  - 2. Height of the precast eccentric cone section shall be either 36", 42", or 48" in height.
  - 3. Joints: Rubber gasketed joint forming a watertight seal conforming to ASTM C443.
  - 4. Size: Inside diameter as indicated on the Drawings.
  - 5. Manhole Steps: Reinforced polypropylene plastic steps with No. 2 deformed grade steel rod.
  - 6. Water Tight Pipe Connections: All manholes shall be fabricated with pipe openings consisting of a rubber boot and stainless steel band in accordance with ASTM C923 to seal off the joint from allowing dirt, ground water, or other objectionable material from entering. These materials shall be installed with the fabrication on all new manholes.
  - 7. Inside Drop Manhole:
    - a. Drop pipe mounting brackets shall be Reliner Stainless Adjustable Pipe Brackets or approved equal, minimum 2" width.
    - b. Stainless steel hardware.
    - c. Epoxy grout is allowed for upper doghouse in place of rubber boot when booted connections are not available due to outside diameter of pipe fitting used for drop pipe connection.
    - d. Drop Tee shall be PVC C905 non-pressure tee. GPK non-stock, 8" Tee extension x G x G, or approved equal.
    - e. 90 Degree Base Bend shall be PVC C905 non-pressure bend. GPK Y24-008 90 EL S x G, or approved equal.
- B. Structure Bases:
  - 1. Pre-cast integral with bottom section of manhole for all structures 8 foot inside diameter and smaller. All structures supplied smaller than 8 foot inside diameter shall also have pre-cast inverts installed.
  - 2. For structures with inside diameters greater than 8 feet, the structure base slab and manhole sections may be separate pre-cast units. A field constructed invert will be required when base slab and bottom manhole section are not integral.

- C. Castings: See Section 33 05 17.

## 2.02 ACCESSORIES

- A. Concrete Materials:
  - 1. Standard Portland Cement Type 1, clean washed sand, crushed rock, and gravel free from deleterious materials for monolithic concrete manholes and all manhole bases.
  - 2. Portland Cement: Comply with the requirements of ASTM C150.
  - 3. Design Mix: Subject to the approval of the Engineer. Use proper water-cement ratio to obtain 4,000 psi in 28 days.
- B. Mortar: Pre-mix bag intended for underground use conforming to ASTM C270 Type M, minimum compressive strength of 2,500 psi.
- C. Joint Sealants:
  - 1. Ramnek, or approved equal.
  - 2. Open cell polyurethane foam sealant, DOW 999, or approved equal.
- D. Adjusting Rings: Conform to Section 33 05 17.
- E. Concrete Embedment Liner: for manhole sections and structure base - HPDE Liner Studliner as manufactured by GSE Lining Technology, Inc., or Sure-Grip as manufactured by Agru.

## PART 3 EXECUTION

### 3.01 TRANSPORTATION

- A. Transport precast units by rail or truck in a manner to avoid excessive stress or strain on units.
- B. Support units during hauling and stockpiling with sufficient hardwood shores to prevent cracking and spalling. Secure units in place to prevent shifting or undesired movements. Location of temporary supports shall be as directed by precast manufacturer.

### 3.02 MANHOLE INSTALLATION

- A. Excavation and Preparation of Trench: Conform to Section 33 05 05.
- B. Furnish and install structures in accordance with Detail Plates as shown on the Drawings.
- C. Place pre-cast integral base section on compacted subgrade and bedding for structures 6 feet diameter and smaller.
- D. Set pre-cast concrete sections plumb with a 1/2 inch (per 4' precast section) maximum out of plumb tolerance allowed:
  - 1. Initial base section shall be set plumb with a 1/4 inch (per 4' precast section) maximum out of plumb tolerance allowed.
- E. Install short precast section (maximum 24-inch height) immediately below the eccentric cone or precast top slab.
- F. Position vertical wall of the eccentric cone on the downstream side.

- G. Casting Adjustment:
  - 1. Conform to Section 33 05 17.
  - 2. Seal joint at the casting frame seat with 2 rows of joint sealer.
- H. Steps:
  - 1. Set the centerline of each step within each manhole to be within 2 inches of the vertical centerline for the group of steps.
  - 2. Locate over downstream pipe, except for pipe 24 inches in diameter or greater. Then place where most appropriate to provide the most suitable access.
  - 3. Offset step centerline from drop openings.
  - 4. Install top step at a maximum of 20 inches below top of casting.
  - 5. Secure in place 12-16 inches on center spacing.
- I. Prevent entrance of dirt and debris from all new and existing manholes.
- J. Pipe Connections:
  - 1. All pipes entering the manhole must be cut with a power saw to provide a clean, smooth pipe surface.
  - 2. Annular space between the outside of the pipe and opening in the structure shall be filled with mortar on the interior and exterior of the structure. Construct an interior collar/doghouse around the pipe from the wall of the structure to the end of the pipe with mortar.
  - 3. The pipe shall protrude a minimum of 2 inches and a maximum of 4 inches inside the wall of the structure at a point  $\frac{1}{2}$  the pipe diameter in a vertical distance from the invert.
- K. Drop manhole inlets shall be constructed in accordance with Standard Detail SAN-7 shown on the Drawings.
- L. Construct Manhole Over Existing Pipe:
  - 1. Construct manhole over existing pipe at locations shown on the Drawings.
  - 2. Saw cut existing pipe to fit flush with inside wall of new structure.
  - 3. Seal any openings in manhole.
- M. Install concrete embedment liner per manufacturer's recommendations.

### 3.03 FIELD QUALITY CONTROL

- A. Failure of any mortar work within a structure (i.e. invert, doghouse, etc.) that occurs during the correction period will be repaired in a manner acceptable to the Owner at the Contractor's expense.

### 3.04 PROTECTION

- A. Secure manholes and structures immediately after completion or before suspension of operations at the end of working day with casting or suitable alternative device.
- B. Mark structure susceptible to being hit by construction or vehicular traffic.

### 3.05 CLEANING

- A. All new manholes shall be thoroughly cleaned of all silt, debris, and foreign matter of any kind prior to final inspection.

## END OF SECTION

# Manhole/Catch Basin Field Elevation Report

Project:	Date:
Owner:	Contractor:
Owner's Resident Project Representative :	Contractor's Representative:
Engineer's Project No:	Owner Project No:

**Contractor is required to complete this form before payment of structure is approved.**

Structure Location				Structure Type (circle one)	Design Invert (from Plan)	As-Constructed Invert Elevation *	Difference ( + / - )	Comments / Quality Assurance
Structure No.	Structure Station	Direction of invert/flow	Street Name or Easement Location					
				MH CB Apron				
				MH CB Apron				
				MH CB Apron				
				MH CB Apron				
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**\* - As-Constructed Invert Elevation provided by Contractor from measurements taken in the field to nearest 0.01 foot**



**SECTION 33 40 00**  
**STORM DRAINAGE UTILITIES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Storm sewer pipe, manholes, catch basins, fittings, and miscellaneous appurtenances.
- B. Related Sections:
  - 1. Section 01 33 00 - Submittal Procedures
  - 2. Section 01 57 13 - Temporary Erosion and Sediment Control
  - 3. Section 32 11 23 - Aggregate Base Courses
  - 4. Section 32 16 13 - Concrete Curbs and Gutters
  - 5. Section 33 05 05 - Trenching and Backfilling
  - 6. Section 33 05 17 - Adjust Miscellaneous Structures

**1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Storm Sewer Pipe: Measurement will be per linear foot for each size, type, and class of pipe furnished and installed complete in place as specified, including excavation, backfilling, and compaction. Pipe will be measured from center of structure to center of structure, to the connection point of existing pipe or to the connection point to flared end sections:
    - a. Pipe bedding will be paid in accordance with Section 33 05 05.
    - b. Improved pipe foundation material, if necessary, shall be per Section 33 05 05.
  - 2. Catch Basin, Catch Basin Manhole, and Manhole Structure: Measurement will be per linear foot of depth from final rim elevation to lowest invert elevation according to type and size for furnishing and installing structures complete in place as specified, including casting frame and cover, adjusting rings, mortar invert (if required) and concrete stool grate frame per Detail STO-38 (if required):
    - a. 70-percent partial payment will be made upon installation and 30-percent payment will be made upon final completion of doghouses and inverts.
  - 3. Flared Ends with trash guard: Measurement will be per each based on size installed, according to type, at locations indicated in the Drawings complete in place as specified, including excavation, backfilling, compaction and trash guard:
    - a. Where a sewer line is terminated with a flared end section, tying the last three joints per Detail STO-12 is considered incidental to the installation of the pipe.
  - 4. Flared Ends without trash guard: Measurement will be per each based on size installed, according to type, at locations indicated in the Drawings complete in place as specified, including excavation, backfilling, and compaction:
    - a. Where a sewer line is terminated with a flared end section, tying the last 3 joints per Detail STO-12A is considered incidental to the installation of the pipe.
  - 5. Random Rip Rap: Measurement will be per cubic yard of Rip Rap placed, according to class. Payment of the Bid Item shall include geotextile fabric, and 4 inch concrete covering of Rip Rap as required per Detail STO-13.
  - 6. Grouted Rip Rap: Measurement will be per cubic yard of Rip Rap placed, according to class. Payment of the Bid Item shall include geotextile fabric, 6 inch concrete layer, and 4 inch concrete covering of the Rip Rap, as required per Detail STO-14.

7. Connect to Existing Pipe: Measurement will be per each connection made, according to size and type of existing pipe, and regardless of type of existing bulkhead or plug, or type of connection made. Payment will include all costs related to making the connection, including removal and disposal of the existing bulkhead or plug, and construction of concrete collar if necessary.
8. Connect Existing Pipe to New Structure: Measurement will be per each pipe connected to the new structure, regardless of size of existing pipe. Payment will include all costs related to making the connection, including removal and replacement of existing pipe as directed by Engineer.
9. Connect to Existing Structure: Measurement will be per each connection made, regardless of size of opening, type of existing bulkhead, or type of existing structure. Saw cutting of the pipe installed in the opening if necessary shall be considered incidental. Core cutting the connection and reconstruction of existing structure invert if necessary shall also be considered incidental to the connection.
10. RC LR Bend: Measurement will be per each, according to size and class. Payment will include all costs related to furnishing and installing the bend, including excavation, backfilling, and compaction.
11. Bulkhead Storm Sewer Pipe: Measurement will be per each bulkhead installed according to size. Payment will include all costs related to bulkheading or plugging the pipe as described in this Section.
12. Poured-In-Place Concrete Seepage Collar: Measurement will be per each collar constructed according to size of pipe it is constructed around. Payment at the Unit Price shall include all costs related to constructing the collar in accordance with Detail STO-24, including excavation, forms, and material.
13. Construct Manhole Over Existing Pipe: Measurement will per linear foot of depth from final rim elevation to lowest invert elevation according to size. Payment will include the cost of the manhole and installation over the existing line, casting frame and cover, and adjusting rings in place as specified.
14. Precast 2 Foot By 3 Foot Outlet Structure, Including Grate and R1737 Casting: Measurement will be per each. Payment will include all costs related to furnishing and installing the structure per Detail STO-25.
15. V-Notch Outlet Structure: Measurement will be per each. Payment will include all costs related to furnishing and installing the structure per Detail STO-25A.
16. Overflow Weir Structure: Measurement will be per each. Payment will include all costs related to furnishing and installing the structure per Detail STO-31.
17. Overflow Structure With Trash Guard: Measurement will be per each according to size. Payment will include all costs related to furnishing and installing the structure per Detail STO-40, including trash guard.
18. Patch Structure: Measurement will be per each storm sewer or sanitary sewer structure patched, regardless of the size of structure or areas patched. Payment will include all cost associated to patching the structure as specified.
19. Vacuum cleaning of all sump manholes to allow inspection by the City as part of the final street construction: Measurement will be per each structure cleaned. Payment will include all costs to remove any water and dirt within the structure.
20. Televis Storm Sewer: Measurement will be per lineal foot of pipe televised, regardless of size or type. Pipe will be measured from centerline of structure to centerline of structure. Payment will be compensation for pipe preparation, televising, providing televising report, and all other associated costs.
21. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

### 1.03 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. A153 - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  - 2. C76 - Specification for Reinforced Concrete Culvert, Drain, and Sewer Pipe
  - 3. C139 - Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes
  - 4. C150 - Specification for Portland Cement
  - 5. C206 - Specification for Finishing Hydrated Lime
  - 6. C361 - Specification for Reinforced Concrete Low Head Pressure Pipe
  - 7. C443 - Specification for Joints for Circular Concrete Sewer and Pipe, Using Rubber Gaskets
  - 8. C478 - Specification for Precast Reinforced Concrete Manhole Sections
  - 9. F2881 – Specifications for 12 to 60 inch Polypropylene Corrugated Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications
  - 10. F477 – Specifications for Elastomeric Seals (Gaskets) For Joining Plastic Pipe
- B. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 (MnDOT Spec.):
  - 1. 2461 - Structural Concrete
  - 2. 2511 - Rip Rap
  - 3. 3601 - Rip Rap Materials
  - 4. 3733 - Geotextiles
- C. National Association of Sewer Service Companies (NASSCO):
  - 1. PACP – Pipeline Assessment Certification Program

### 1.04 SEQUENCING AND SCHEDULING

- A. Maintain existing storm sewer flows during construction. This may require a temporary pipe connection during periods of time when construction is not occurring.
- B. Set up traffic control to prior to removals. Maintain traffic during storm sewer improvements unless otherwise approved by Owner.
- C. Do not pursue work-causing shut off of utility service (gas, water, electric, telephone, TV, etc.) to consumers until the utility owner is contacted and all consumers are notified of the shut-off schedule.
- D. Successfully complete required inspections and tests before commencement of Section 32 11 23 and Section 32 16 13.
- E. Coordinate inspection of completed sump structures with City prior to acceptance. May require pumping water and vacuuming dirt out of structure prior to inspection.
- F. Televis Storm Sewer:
  - 1. Notify Engineer 48 hours in advance of the televising of all pipes.
  - 2. Complete all required mandrel and air testing prior to televising.
  - 3. All private utilities shall be installed by others prior to televising storm sewer.
  - 4. Start televising no sooner than 30 days, but no later than 60 days after all utility, excavation, and street subgrade work is completed as part of this contract.

### 1.05 SUBMITTALS

- A. Submit Shop Drawings for storm sewer structures consistent with Section 01 33 00.

- B. Shop drawings shall indicate complete information for fabrication and installation of units. Include the following:
  - 1. Plans and elevations locating and defining all material furnished by manufacturers.
  - 2. Sections and details showing connections, cast-in items, and field installed lifting devices, capacities, all openings, and their relation to the structure.
- C. Submit Manufacturer's Certificate of Compliance for the following items:
  - 1. Gray iron castings.
  - 2. Precast manhole sections.
  - 3. Rip rap.
- D. Manhole/Catch Basin Elevation Report:
  - 1. Complete the report attached to the end of this Section for each structure as it is constructed. Submit complete report each week to the Engineer or the Engineer's designated representative at some mutually agreeable time.
- E. Televising Report:
  - 1. Submit 1 copy of the Written Report and Video Report within 30 days of completion of televising.
  - 2. Report Requirements:
    - a. Each run shall consist of a starting and ending structure number and a zero reading on the counter at center of the starting structure.
    - b. Examine each service wye by using the pan and tilt feature.
    - c. Location, length and identify sags within the flowline of the pipe of 10% or greater, example 0.06' for an 8" diameter pipe.
    - d. Location in change in pipe material to be noted.
    - e. The video camera operator shall type into the video the station (distance), wye location on either the left or right side of the pipe, and any problems they notice while televising the sewer lines.
    - f. Take a still photograph at any questionable joint or possible defect.
  - 3. Provide a Written Report with a graphic cross section of the pipe showing the manholes, all wye connections, and defects. This report shall include PACP codes and descriptions.
  - 4. Submit a Video Report in a DVD format with audio, including a printable version of the Written Report and full video of all televised pipe runs.
- F. Submit Product Data for the following items consistent with Section 01 33 00:
  - 1. Mortar mix

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Ready Mix Mortar Materials: Sand Mix, 4,000 PSI
- B. Mortar: Pre-mix bag intended for underground use conforming to ASTM C270 Type M, minimum compressive strength of 2,500 psi.

### **2.02 STORM MANHOLE AND CATCH BASIN FRAMES AND COVERS**

- A. Conform to Section 33 05 17

## 2.03 STORM MANHOLES AND CATCH BASINS

- A. Precast concrete sections conforming to ASTM C478 and this section:
  - 1. No structure constructed either partially or completely from segmental block will be accepted:
    - a. Shallow structures that cannot be constructed in the standard manner shall be fabricated in a precast design similar to Detail Drawing STO-9.
  - 2. Preformed inverts are not allowed.
  - 3. No structures with any cracks will be accepted.
  - 4. All sections shall be cured by an approved method and shall not be shipped nor subjected to loading until the concrete compressive strength has attained 4,000 psi.
  - 5. The date of manufacture and the name and trademark of the manufacture shall be clearly marked on the inside of each precast section.
- B. Size: Dimensions as indicated on the Drawings.
- C. Special requirements are shown on the Drawings.
- D. Manhole Joints: Rubber gasketed joint forming a watertight seal conforming to ASTM C443.
- E. Manhole Steps: Reinforced polypropylene plastic steps with No. 2 deformed grade steel rod.
- F. Design:
  - 1. Have the manhole sections and top and bottom slabs designed and the detailed drawings prepared by a Professional Engineer, experienced in precast concrete manhole design, who is registered in the Project's state.

## 2.04 PIPE MATERIALS

- A. Reinforced Concrete Pipe (RCP) and Fittings:
  - 1. General Requirement: ASTM C76.
  - 2. Profile gaskets: shall be synthetic rubber, circular reinforcing in cross-section, and shall conform to ASTM C443.
  - 3. Pipe Joints: Bell and spigot ASTM C361.
  - 4. Pipe Class: As shown on the Drawings.
  - 5. Marking: Each pipe shall be identified with the name of the manufacturer trade name or trademark and code, identification of plant, date of manufacture, and the pipe class and specification design.
- B. Corrugated Polypropylene Pipe (PP), dual wall:
  - 1. Pipe shall have a smooth interior and annular exterior corrugations meeting ASTM 2881 and AASHTO M330.
  - 2. Pipe joint shall be a gasketed integral bell & spigot. Bell and spigot connections shall utilize a spun-on, welded or integral bell and spigot with gaskets meeting ASTM F477.
  - 3. Fittings shall conform to ASTM 2881 and ASSHTO 330.
  - 4. Material properties, Polypropylene compound for pipe and fittings shall be impact modified copolymer meeting material requirements ASTM F2736, Section 4, ASTM F2881 Section 5 and ASSHTO M330.
- C. Pipe Coupling for Concrete End Section Connections:
  - 1. Mar Mac Dissimilar Coupling, or equal.

## 2.05 TRASH GUARDS

- A. General Requirement: ASTM A153.
- B. Materials: Galvanized steel rods meeting the requirements in ASTM A153.
- C. Bar size and configuration as shown on the Drawings.
- D. Securely attached to end section.

## 2.06 RIP RAP

- A. General Requirement: Conform to MnDOT Spec. 2511:
  - 1. Rip Rap Materials: Conform to MnDOT Spec. 3601
  - 2. Granular Filter: Conform to MnDOT Spec. 3601.2.B.1
  - 3. Geotextile Filter: Conform to MnDOT Spec. 3733, Type 4
  - 4. Concrete: Conform to MnDOT Spec. 2461

## 2.07 CONCRETE STOOL GRATE FRAME FOR OFF STREET CATCH BASIN

- A. General Requirement: Conform to Standard Detail Plate STO-38.

# **PART 3 EXECUTION**

## 3.01 PREPARATION

- A. Trench Excavation and Backfill shall conform to Section 33 05 05.

## 3.02 EXAMINATION

- A. Perform televising pipeline inspections in accordance with NASSCO Pipeline Assessment and Certification Program (PACP). When requested provide the require certification for personnel preforming the actual work.
- B. Commence test procedures only when pipe and structures are clean and free of dirt, water, or other foreign matter. Pipe cleaning shall be performed in accordance with NASSCO Jetter Code of Practice.

## 3.03 INSTALLATION

- A. Connect to Existing Structure:
  - 1. Connect to existing structure at location shown on the Drawings.
  - 2. Core the hole in the structure and saw cut the pipe. The pipe shall protrude a minimum of 2 inches and a maximum of 4 inches inside the wall of the structure at a point  $\frac{1}{2}$  the pipe diameter in a vertical distance from the invert.
  - 3. Bulkhead void between outside wall of pipe and edge of opening with mortar and block/brick.
  - 4. Reconstruct manhole bench/invert.
- B. Connect Existing Pipe to New Structure:
  - 1. Where an existing structure is removed and replaced with a new structure, connect all existing pipes to the new structure.
  - 2. Remove pipe segments that are damaged during the structure replacement with new pipes of the same size and type, or as directed by Engineer.

3. Saw cut existing or new pipes to protrude a minimum of 2 inches and a maximum of 4 inches inside the wall of the structure at a point  $\frac{1}{2}$  the pipe diameter in a vertical distance from the invert.
  4. Bulkhead void between outside wall of pipe and edge of opening with mortar and block/brick.
- C. Connect to End of Existing Pipe:
1. Connect to existing pipe at locations shown on the Drawings.
  2. Locate and expose end of existing pipe.
  3. Remove existing bulkhead or plug and dispose of off Site:
    - a. Take care not to damage existing pipe.
    - b. Any segment of pipe damaged by Contractor shall be replaced with new materials at no expense to the Project.
  4. Utilize standard bell and spigot joint with rubber profile gasket if possible.
- D. Pipe Installation:
1. Lay and maintain pipe appurtenances to the alignment, grade, and location shown on the Drawings and/or staked in the field. No deviation from the Drawing and/or staked alignment, grade, or location is allowed, unless approved by Engineer. Deviation from grade in excess of 0.05 percent (with no intermediate high points, level sections, or reverse invert slope) may be cause for removal and relaying pipe at the Contractor's expense.
  2. General Pipe Installation Procedures:
    - a. Wipe joints clean; apply the manufacturer's recommended lubricant compound over the entire joint surface; center spigot in bell and push spigot home; take care to prevent dirt from entering the joint space; bring pipe to proper line and grade, and secure pipe in place by properly bedding.
  3. Lay pipe upgrade with spigot ends pointing in the direction of flow.
  4. All joints must be watertight.
  5. Remove all foreign matter or dirt from inside the pipe. Keep the bell and spigot clean during and after installation. Take care to prevent dirt from entering the joint space. Remove any superfluous material from inside the pipe after pipe installation by means of an approved follower or scraper.
  6. Where cut-ins make it impossible to construct bell and spigot joints or when dissimilar pipe materials are joined, a reinforced concrete collar shall be placed completely surrounding the joint or the connection shall be made by using an approved adapter.
  7. Any pipe which has been disturbed after being laid must be taken up, the joint cleaned and properly re-laid as directed by the Engineer.
  8. Trash guards are not required on downstream pipes 24" diameter and smaller.
  9. Where a sewer line outlets to grade or where the line is terminated with a flared end section:
    - a. Fasten at least the last 3 joints together using 2 "U" bolt fasteners per joint approved and as recommended by the pipe manufacturers, on the outside of the pipe.
  10. Reinforced concrete flared end section shall be installed regardless of the type of pipe material.
  11. Reinforced concrete flared end section shall be connected to Corrugated PP with pipe coupling, per the manufactures recommendations.
  12. Corrugated PP requires temporary cover (compacted backfill) for construction traffic at a 3' minimum depth.
- E. Structures and Appurtenances Installation:
1. Furnish and install structures in accordance with the Drawings.
  2. Excavate to depth and size as shown in the Drawings.
  3. Structure inverts:
    - a. Construct inverts of manholes and catch basins using a Ready Mix mortar material (sand mix 4,000 PSI).

- b. Construct inverts shaped to the half section of equivalent size pipe conforming to the inlet and outlet pipe so as to allow for a free, uninterrupted flow with all surfaces sloping to the flow line.
  - 4. Concrete pipes entering manholes:
    - a. End of pipes must be cut with a concrete saw.
    - b. Annular space between the outside of the pipe and opening in the structure shall be filled with mortar on the interior and exterior of the structure. Construct an interior collar/doghouse around the pipe from the wall of the structure to the end of the pipe with mortar.
  - 5. Steps:
    - a. Locate on the downstream side, except for pipe 24 inches in diameter or greater. Install in the most appropriate place, to provide suitable access.
    - b. Secure and neatly mortar in place 16 inches on center spacing.
  - 6. Position vertical wall of the eccentric cone on the downstream side.
  - 7. On structures with a build that contains more than 1 barrel section, the section immediately below the precast top slab shall be maximum 24 inch height.
  - 8. Lift holes shall be neatly mortared up.
  - 9. Remove all debris from Structures, invert and benches prior to final inspection and acceptance.
  - 10. Remove all water and debris from Sump Manhole Structures, to allow for final inspection and acceptance.
  - 11. Install Adjustment Rings and Adjust Casting: Conforming to Section 33 05 17.
- F. Construct Manhole Over Existing Pipe:
- 1. Construct manhole over existing pipe at locations shown on the Drawings.
  - 2. Saw cut existing pipe to fit flush with inside wall of new structure.
  - 3. Seal any openings in manhole.
- G. Rip Rap:
- 1. General: Conform to MnDOT Spec. 2511.
  - 2. Install Rip Rap per Detail Plate STO-13 and STO-14 prior to placement of flared end section.
  - 3. Place 6" thick layer of concrete at the midpoint of the Rip Rap per Detail Plate STO-14.
- H. Bulkhead Pipe:
- 1. Bulkhead pipe at locations shown on Drawings with brick, mortar, or concrete block masonry 8 inches thick.
  - 2. Precast concrete plugs may be used in lieu of bulkhead. Plug must fit snugly into pipe opening and be watertight.
- I. Seepage Collar:
- 1. Construct at location indicated on Drawings.
  - 2. Construct per Detail on Drawings.
- J. Patch Structure Walls, Doghouse, Invert, or Rings:
- 1. Clean areas to be patched by removing debris, loose concrete, and any other foreign materials.
  - 2. Patch area with mortar to provide smooth patch that seals the structure.
- K. Concrete Stool Grate Frame:
- 1. Construct on off street catch basins as shown on the plans or as directed by Engineer.
  - 2. Construct per Detail on Drawings.
- L. Storm Structure Location Marker:
- 1. Off street structures shall be marked permanently with the specified sign and sign post as indicated on the plans.



2. Install sign in accordance with Spec. Section 34 41 05

### 3.04 FIELD QUALITY CONTROL

#### A. Scope:

1. All pipeline testing is considered incidental to the Bid cost of the pipe.
2. Engineer to observe and verify that all tests and visual inspections have been completed prior to final acceptance.

#### B. Cleaning:

1. Consists of Cleaning the Pipe and Structures:
  - a. If newly installed mains and structures are kept clean during construction, cleaning will not be required.
  - b. If newly installed mains and/or structures become dirty due to negligence of the Contractor, cleaning will be performed at the sole expense of the Contractor.
2. The bailing or flushing method of cleaning pipe is acceptable only if adequate provisions acceptable to the Engineer for keeping dirt and debris out of the existing sewer system or ponds are employed. Jetting may be required.
3. Complete prior to final inspection for acceptance.

#### C. Required Tests and Inspections:

1. Infiltration:
  - a. To determine the amount of ground water infiltration into the sewers.
  - b. Test waived if no visible infiltration is observed during the lamping inspection.
  - c. Measurement made by means of 90 degree v-notch weirs placed in the lines as directed by the Engineer.
  - d. Measurements taken at the points where in the Engineer's opinion the flow of water in the sewer is greater than the maximum allowable leakage.
  - e. Maximum Allowable Rate of Leakage: Not more than 100 gallons per mile per inch diameter per day.
  - f. Tests may be taken between individual manholes and the infiltration in any given line must not exceed the specified maximum allowable rate.
  - g. Method of Measurement: Measurement of time for a predetermined volume of flow to occur.
2. Trench Backfill Compaction:
  - a. The Owner shall have an independent testing laboratory perform, as minimum, the following tests. The location of the tests shall be determined by the Engineer:
    - 1) 1 density test for every 300 feet of trench at varying depths (per each 10' depth increment).
3. Alignment:
  - a. Horizontal deviation in excess of 3 inches from back of curb to back of structure opening (for casting and rings) is not allowed. Deviation in excess of 3 inches will be cause for reinstallation of structure at the Contractor's expense.
  - b. The vertical and horizontal alignment of the casting adjustment shall be approved by the Engineer prior to constructing the 10-foot concrete curb and gutter transition on either side of the casting.
4. Deflection testing for Corrugated PP shall be in accordance with Spec. Section 33 08 30, paragraph 3.02.E Gravity Pipe Deflection Testing.

### 3.05 STORM SEWER CLOSED CIRCUIT TELEVISION INSPECTION

- A. Televising:
  - 1. Newly installed storm sewer segments must be in a clean and ready condition prior to the television inspection.
  - 2. Immediately clean any lines found to be dirty prior to televising. Costs for all such cleaning shall be the responsibility of the Contractor.
  - 3. Provide sufficient water to run through the new storm sewer system prior to televising lines to be able to distinguish any sags or alignment problems with the pipe.
  - 4. Personnel completing televising must be PACP certified.
  - 5. Final acceptance of the video report will require the pipe to be clean as a new pipe.
- B. General:
  - 1. Provide a camera that will be self-propelled and will have the ability to tilt up and down and pan left and right. The camera must provide color images.
  - 2. Speed shall not exceed 30 feet per minute.
- C. Defects:
  - 1. Immediately correct any defects, faulty joints, cracked pipe, or other deficiency noted by the television inspection.
  - 2. A plan for repair shall be presented to and approved by the Owner and Engineer prior to the repair occurring.
  - 3. Re-televising all corrected pipe runs after correction.
  - 4. Any costs associated with correction and re-televising of the sewer system will be paid by the Contractor.

### 3.06 PROTECTION

- A. Plug all entrances and openings to the system promptly and before suspension of operations at the end of working day.
- B. Secure manholes and structures immediately after completion or before suspension of operations at the end of working day with castings or suitable alternative device.
- C. Mark all structures to avoid being hit by construction or vehicular traffic.
- D. Mark each plug location with 4 inches by 4 inches timbers to above grade to aid in marking the future connection.
- E. Establish erosion control measures as per Section 01 57 13.

**END OF SECTION**

# Manhole/Catch Basin Field Elevation Report

Project:	Date:
Owner:	Contractor:
Engineer's Resident Project Representative :	Contractor's Representative:
Engineer's Project No:	Owner Project No:

**Contractor is required to complete this form before payment of structure is approved.**

Structure Location				Structure Type (circle one)	Design Invert (from Plan)	As-Constructed Invert Elevation *	Difference ( + / - )	Comments / Quality Assurance
Structure No.	Structure Station	Direction of invert/flow	Street Name or Easement Location					
				MH CB Apron				
				MH CB Apron				
				MH CB Apron				
				MH CB Apron				
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**\* - As-Constructed Invert Elevation provided by Contractor from measurements taken in the field to nearest 0.01 feet.**

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## **SECTION 33 46 00**

### **SUBDRAINAGE**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Storm sewer service and drain tile.
- B. Related Sections:
  - 1. Section 33 05 05 - Trenching and Backfilling
  - 2. Section 33 31 14 - Sanitary Sewer Services

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
  - 1. Perforated PVC Drain Tile, Schedule SDR 26: This Bid Item shall be used for installation of Drain Tile for subgrade drainage within street areas. Measurement will be by linear feet of pipe along its axis, according to size, and with no regard to intervening fittings. Payment shall include all costs related to furnishing and installing the draintile pipe per standard detail STO-19, including geotextile, aggregate and fittings:
    - a. It should be noted that due to the estimation required for Drawing preparation, the quantity of drain tile actually constructed may vary significantly from those given in the Bid Form.
    - b. The Engineer reserves the right to increase or decrease the Drain Tile quantity, and associated Connect Drain Tile to Structure quantity, with no change to the Contract Unit Price. No additional compensation will be considered or allowed for changes to the estimated quantities or for the deletion of any of these Bid Items in their entirety.
  - 2. Connect Drain Tile to Existing Structure: Measurement will be per each. Payment will include all costs related to core drilling a hole in the storm sewer structure, making the connection, and patching as specified.
  - 3. Storm Sewer Service: Measurement will be by linear feet of pipe actually installed, according to size and type, as measured along the axis of the pipe with no regard to intervening fittings. Payment at the Unit Price shall be compensation in full for all work and costs, including excavation, pipe, fittings, backfill, and trench compaction:
    - a. Connecting to an existing hole in a precast structure will be considered incidental to the installation of the service pipe.
    - b. PVC plug for the end of the service is considered incidental.
  - 4. Pipe Bedding for the PVC Storm Sewer Service Pipe: Measurement and payment shall be per Section 33 05 05.
  - 5. Supplying and installing required markers at service ends shall be considered incidental to the service installation.
  - 6. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 REFERENCES**

- A. American Society of Testing and Materials (ASTM):
  - 1. D1784 - Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (PVC) Compounds

2. D3034 - Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
  3. D3212 - Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
  4. F477 - Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- B. Minnesota Department of Transportation "Standard Specifications for Construction" and "Materials Lab Supplemental Specifications For Construction" 2018 Edition (MnDOT Spec.):
1. 3149 - Granular Material
  2. 3733 - Geotextiles

#### 1.04 SEQUENCING AND SCHEDULING

- A. Install sanitary sewer, water main, storm sewer, and all pipe deeper than the services prior to the installation of the services.
- B. Install draisile after completion of aggregate backfill and prior to gravel base placement.

### **PART 2 PRODUCTS**

#### 2.01 PIPE AND FITTINGS

- A. Drain Tile: PSM Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings:
  1. General: Pipe and fittings shall be made of compounds conforming to ASTM D1784 in accordance with the material requirements of ASTM D3034.
  2. Design: Integral bell gasketed joint and a minimum wall thickness conforming to SDR 26.
  3. Joints: Elastomeric gasket joints providing a water-tight seal conforming to ASTM D3212 or ASTM F477.
  4. Perforations: Circular on 3-1/4 inches by 6-1/4 inches centers. Hole size: maximum of 3/8 inch and a minimum of 3/16 inch, arranged in 4 rows along the full length of the pipe.
- B. Storm Sewer Service: Poly (Vinyl Chloride) (PVC) Schedule 40 Plastic Pipe conforming to Section 33 31 14.

#### 2.02 BEDDING MATERIAL FOR STORM SEWER SERVICE

- A. Granular Borrow meeting MnDOT Spec. 3149.2.B.1, Modified:
  1. 100 percent passing, by weight, the 1 inch sieve.
  2. Furnished by Contractor from a site located off the Site.
  3. No on Site granular material encountered during construction may be used.

#### 2.03 DRAIN TILE AGGREGATE

- A. Course Filter Aggregate conforming to MnDOT Spec. 3149.2.H., and as modified herein:
  1. Excluding crushed carbonated quarry rock, crushed concrete, and salvaged bituminous.

#### 2.04 GEOTEXTILE

- A. Geotextile wrap shall conform to MnDOT Spec. 3733, Type 1.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. The location and alignment of the subsurface drains and outlets will be determined in the field by the Engineer, based on subsurface conditions.

### **3.02 DRAIN TILE INSTALLATION**

- A. Conform to details on Drawings.
- B. Construct at locations and elevations determined by Engineer or as shown on the Drawings.
- C. Pipe Bedding: drain tile aggregate.
- D. Grade: Unless otherwise specified or shown on the Drawings, the grade of pipes shall not be flatter than 0.50 percent grade or match the street grade.
- E. Plug upstream end of the drain pipe.
- F. Sections of the drain pipe shall be firmly joined.
- G. Place pipe so that the perforations are in the position indicated on the Drawings or designated by the Engineer.
- H. Connections: Connect to hole provided in precast structure. Seal joint with mortar. Core drill connection to structure where precast hole is not provided.
- I. Compaction: Conform to Section 33 05 05.
- J. Flushing: After installation has been completed, pipes shall be flushed with sufficient water to remove material that has entered the pipes during construction.

### **3.03 STORM SEWER SERVICE INSTALLATION**

- A. Construct at locations and elevations determined by Engineer or as shown on the Drawings.
- B. Pipe Bedding: Bedding material.
- C. Plug upstream end of pipe.
- D. Sections of the pipe shall be firmly joined.
- E. Connections: Connect to hole provided in precast structure. Seal joint with mortar. Core drill connection to structure where precast hole is not provided.
- F. Compaction: Conform to Section 33 05 05.

### **3.04 FIELD QUALITY CONTROL**

- A. Do not backfill trench until the pipe has been inspected and approved by the Engineer.
- B. Compact all trench backfill with mechanical means by "Quality Compaction Method."

### 3.05 PROTECTION

- A. Mark each storm sewer service plug location with 4 inch by 4 inch timbers to above grade to aid in marking the future connection.

**END OF SECTION**



## **SECTION 34 41 05**

### **TRAFFIC SIGNS AND DEVICES**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section Includes:
1. Signs, signposts, and hardware
  2. Double wooden barricades

##### **1.02 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment:
1. All new signs shall be measured in accordance with MnDOT Spec. 2564.4.G. Payment for all sign installation shall be at the Bid Unit Price per unit of measure of square feet and shall include all materials, equipment, and labor necessary to install each sign and post(s) at the staked location:
    - a. There will be no extra compensation for posts, regardless of length or required configuration.
    - b. There shall be no extra compensation for post installations in bituminous or concrete surfaces.
  2. Street Name Sign (2 Blades), Including Post and Hardware and Street Name Sign (1 Blade), Including Post and Hardware: Measurement shall be by the unit of each complete sign assembly installed. The complete sign assembly shall include all blades, posts, anchors, and necessary hardware. Payment of the Bid Item shall include all materials, equipment, and labor necessary to install each sign and post(s) at the staked location. There will be no extra compensation for posts, regardless of length or required configuration.
  3. Permanent Barricade: Measurement will be per each. Payment will include all costs related to furnishing and installing the barricade per the Standard Detail:
    - a. The future road extension sign, if required, will be paid separately as a new sign under the appropriate Bid Item.
  4. Structure Marker Sign: Measurement will be per each. Payment will include all costs related to furnishing and installing the sign and sign post per the Standard Detail.
  5. City Property Monument Sign Post: Measurement will be per each. Payment will include all costs related to furnishing and installing the Property Monument Post per the Standard Detail.
  6. All other Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

##### **1.03 REFERENCES**

- A. Minnesota Department of Transportation "Standard Specifications for Construction", 2018 Edition (MnDOT Spec.):
1. 2564 - Traffic Signs and Devices
  2. 3352 – Signs, Delineators, and Markers
- B. Minnesota Manual on Uniform Traffic Control Devices (MMUTCD)
- C. Minnesota Department of Transportation Standard Signs Manual

#### 1.04 DELIVERY, STORAGE, AND HANDLING

- A. Upon delivery to the Site, store the materials at least 10 feet away from any construction or traveled roadways areas. Vehicles and equipment shall not be stored, even temporarily, in the buffer zone of the work area or where it would be so close to moving traffic that it is in the judgment of the Engineer a potential hazard to motorists.

#### 1.05 SEQUENCING AND SCHEDULING

- A. Notify the Engineer at least 48 hours prior to commencing the work under this Section of the Contract for required construction staking.
- B. Schedule an onsite pre-signing meeting with the Owner, Engineer, and Signing Subcontractor (if appropriate) a minimum of 24 hours prior to the installation of any signing.
- C. Schedule private utility locates through Gopher State One. Call program prior to sign post installation.
- D. Contact Washington County for all signs within the County right-of-way that will require temporary or permanent removal.
- E. Install signs within 7 calendar days after placement of the pavement adjacent to the sign locations.
- F. Install signs concurrently with paving done under traffic.

### **PART 2 PRODUCTS**

#### 2.01 MATERIALS

- A. Sign Material:
  - 1. Sign Panel Base Material: Sheet aluminum conforming to the material requirements of MnDOT Spec. 3352.2.A.1.a.
  - 2. Sign Face Material:
    - a. Traffic Sign Panels: Reflective sheeting conforming to the requirements of MnDOT Spec. 3352.2.A.2. Diamond Grade DG3, Electro cut or silk screen only, no digital printing.
    - b. Street Name Blade Signs: reflective sheeting, Diamond Grade DG3, Electro cut or silk screen only, no digital printing.
  - 3. Sign Legend Material for Signs: "Direct Applied" conforming to the requirements of MnDOT Spec. 3352.2.A.5.
  - 4. Street Name Blade Signs:
    - a. Single-faced flat blades.
    - b. Address numbers provided at a later date.
    - c. Public Streets: signs to be "green" in color with "white" lettering.
    - d. Private Streets: signs to be "blue" in color with "white" lettering.
    - e. Secure to post using 3/8" rivets with nylon washer. Secure ends of blades using #34 Cherryrate Rivets and 1-3/4" PVC spacers.
- B. Sign Panels:
  - 1. Sign panels shall be fabricated and hole punched in accordance with the standard drawings in the MnDOT Standard Signs Manual.

C. Sign Posts:

1. General:

- a. Posts, hardware, and anchor systems shall be Telespar square tube systems.
- b. All signs 36" x 36" and larger shall be installed on a double Telespar Post.

2. Traffic Signs:

a. Boulevard Installation:

- 1) 1-3/4 inches square.
- 2) 12 gauge galvanized steel.
- 3) Length: Minimum 8 feet, maximum 12 feet. Length shall be determined by Contractor as necessary to meet the construction requirements of the references and this Section at each specific sign location:
  - a) Telespar Part No.: 16530 (8 foot)
  - b) Telespar Part No.: 16025 (9 foot)
  - c) Telespar Part No.: 16020 (10 foot)
  - d) Telespar Part No.: 16015 (11 foot)
  - e) Telespar Part No.: 16015 (12 foot)

b. Concrete Median Installation:

- 1) 2 inches square
- 2) 12 gauge galvanized steel
- 3) Length: 9 feet, or as determined by Contractor as necessary to meet the construction requirements of the references and this section at each specific sign location:
  - a) Telespar Post Part No. 16125 (9 foot)

3. Street Name Signs:

- a. 1-3/4 inches square.
- b. 12 gauge galvanized steel.
- c. Length: Minimum 8 feet, maximum 12 feet. Length shall be determined by Contractor as necessary to meet the construction requirements of the references and this Section at each specific sign location.

4. Anchor System:

a. Boulevard Location and Street Name Sign Location - Omni Anchor:

- 1) 2 inches square, 3 feet long (Part No. 16155).
- 2) 2-1/4 inches square, 18 inch long Omni sleeve (Part No. 16620).
- 3) 12 gauge galvanized steel.
- 4) Finish installation should allow 2 holes to remain above finish grade.

b. Concrete Median Location – Kleen Break Anchor:

- 1) Kleen Break Surface Mount Anchor (Model No. 425), with receiving coupler, shear bolt and locking wedge.
- 2) Mount to surface using Galvanized Simpson Strongtie Titan HD Concrete anchor bolt 1/2" x 4" (1/2" bolt shank):
  - a) 3D Specialties (Part No. 55820).
  - b) Minimum embedded depth of 3-5/8".
  - c) Allowable tension load shall be 2,270 lbs. when installed in 3000 psi concrete.
  - d) Allowable shim of up to 1/2".
  - e) Longer bolt is acceptable to maintain the 3-5/8" minimum embedment depth when shimming.
- 3) Use 2in square x 9ft, 12 gauge Telespar posts (Part No. 16125) with a 1 3/4in square x 3ft, 12 gauge Telespar post (Part No. 15520) insert in the bottom (to cover bumper strike area).
- 4) Follow Kleen Break Model 425, Drawing No. XKBSM425-20-CI, for installation instructions.

5. Hardware:
  - a. Sign Panel: No rivets:
    - 1) 5/16 – 18 by 2-1/2 inch galvanized carriage bolts
    - 2) 7/8" OD Nylon washer
    - 3) 5/16 – 18 galvanized hex nuts
  - b. Anchor System: Boulevard Location:
    - 1) 5/16 inch diameter medium corner bolt with nut. Galvanized. (Telespar Part No. 56202).
  - c. Street Name Signs:
    - 1) 3/8" Drive Rivets with nylon washer to secure sign to post.
    - 2) Only 2 name blades per sign post, unless approved by Engineer.
    - 3) Per Standard Detail Plate STR-27A.
- D. Permanent Barricade:
  1. Per Standard Detail STR-11.
- E. Structure Marker Sign:
  1. Per Standard Detail Plate STR-23.
  2. 6 inch by 12 inch sign panel.
  3. Sign sheeting and lettering:
    - a. For sanitary structures: green HIP sheeting with white border and lettering "MH".
    - b. For storm structures: green HIP sheeting with white border and lettering "SW".
    - c. For water structures: blue HIP sheeting with white border and lettering "WAT".
  4. U-Channel Galvanized Post, Minimum 3lb/foot, 6'-6" length
- F. City Property Monument Sign Post:
  1. Per Detail Plate STR-42:
    - a. 4"X4" Square Composite post with rounded edges and corners.
    - b. 8' Length
    - c. Dark Brown

## 2.02 SOURCE QUALITY CONTROL

- A. All material certification shall conform to MnDOT Spec 2564.

## PART 3 EXECUTION

### 3.01 GENERAL

- A. Unless otherwise noted or modified herein, all sections of MnDOT Spec. 2564, all sections of MnDOT's Standard Signs Manual, and Chapter 6 of MMUTCD shall apply.
- B. The fabrication of all signs and devices shall conform to MnDOT Spec. 2564 and the latest edition of the MMUTCD and the MnDOT Standard Signs Manual.
- C. The sign number designation indicated on the Drawings shall comply with applicable requirements of MMUTCD and MnDOT Standard Signs Manual.

### 3.02 PREPARATION

- A. Submit shop drawings for street name sign blades to the Owner and Engineer for review and approval prior to fabrication:

1. Address numbers for the name signs blades will be provided to the Contractor after the City Building Department has assigned addresses to this development.

### 3.03 CONSTRUCTION

- A. Sign locations shown on the Drawings are only approximate. The final locations shall be determined in the field by the Engineer. Have all underground utilities located prior to installing all signposts. Provide Engineer 48-hour notice prior to sign installations to allow for adequate staking time:
  1. Standard location for traffic sign posts shall be a 6 feet behind the back of curb or edge of traveled road.
  2. Standard location for street name sign posts shall be a minimum 8 feet behind the back of curb or edge of traveled road at mid-radius.
  3. The lowest point of any traffic sign panel installed shall be 7 feet above finish grade at the point of installation. The lowest point of any street name sign installed shall be 10 feet above finish grade at the point of installation
- B. Fabricate, hole punch, and mount sign panels in accordance with the standard drawings in the MnDOT Standard Signs Manual. Date the back of each newly installed sign panel with a theft warning sticker stating the month and year using inventory/I.D. stickers approved by the Owner.
- C. Install nylon washers between the bolt and the sign face (sheeting) to protect face. Do not over tighten bolts to the point where the sign sheeting separates from the sign backing, which would be cause for rejection and replacement at no additional cost to the Contract. The nylon washers used to protect to sign face shall be 1/32 inch thick, have a maximum inside diameter of 3/8 inch, and outside diameter of 7/8 inch. There shall also be a stainless steel washer between the nylon washer and the bolt head.
- D. Street Name Blade Post shall not extend above the street name blades.
- E. Post Anchorage:
  1. Install 2 inch, or 2-1/4 inch by 3 foot 2 inches above finish grade.
  2. Install 2-1/4 inch, or 2-1/2 inch by 18 inch Omni Anchor sleeve.
  3. Insert sign post (minimum 6 inches) into Omni anchor and secure with corner bolt.
  4. Within concrete median: Install Surface Mount Anchor and bolts as shown on Standard Detail Plate STR-28
- F. Permanent Barricade:
  1. Install at locations shown on Drawings and per Standard Detail STR-11.
  2. Barricades to span entire roadway.
  3. If shown on Drawings or required by Engineer, attach "Future Road Extension Sign" per Standard Detail STR-24.
  4. If shown on Drawings or required by the Engineer, attach "end of road marker", 9 button OM4-2 red on black sign.
- G. Structure Marker Sign:
  1. Install at locations shown on the Drawings.
  2. Install sign post with 2 foot depth bury.
- H. City Property Monument Sign Post:
  1. Install at locations shown on the drawings, per detail plate STR-42, and as staked by the Engineer.
  2. Lettering:

- a. "City Property" Engraved into the post.
  - b. Letters to be Arial, 0.15' height.
  - c. Start lettering 0.5' from top of post.
- 3. Post Installation:
  - a. Mounted 4.5' above ground.
  - b. Set 3.5' in the ground.
  - c. Placed with lettering facing the private property.

#### 3.04 FIELD QUALITY CONTROL

- A. All work shall conform to MnDOT Spec. 2564.

#### 3.05 CLEANING

- A. Clean any sign after installation if requested by the Engineer.

### **END OF SECTION**